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THE IRON TRADE REVIEW

Published Weekly
Vol. LXIII No. 14

CLEVELAND, OCTOBER 3, 1918

Entered as second-class matter at the post office at Cleveland, Ohio, under the act of March 3, 1879

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Single Copies 15 Cents

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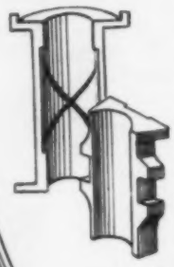
Helps you to serve your Government

by eliminating the use of tin base metals

Saves your power

and prevents scored shafting



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By using "NOHEET" bearing metal you can practically eliminate tin and economize on coal, men and power.

"NOHEET" bearing metal is superior to tin base metals in elastic limit tensile strength and will not score journals under any conditions. It furthermore adds greatly to the life of each installation.

Make "NOHEET" the standard metal for all classes of bearing work.

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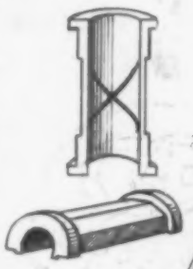

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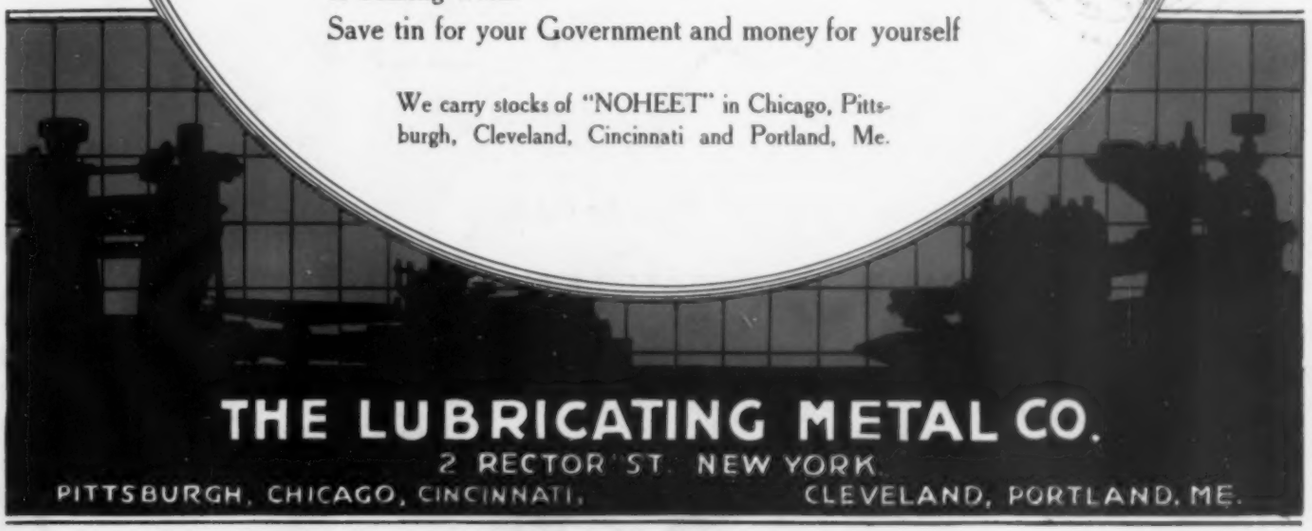

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2 RECTOR ST. NEW YORK

PITTSBURGH, CHICAGO, CINCINNATI, CLEVELAND, PORTLAND, ME.

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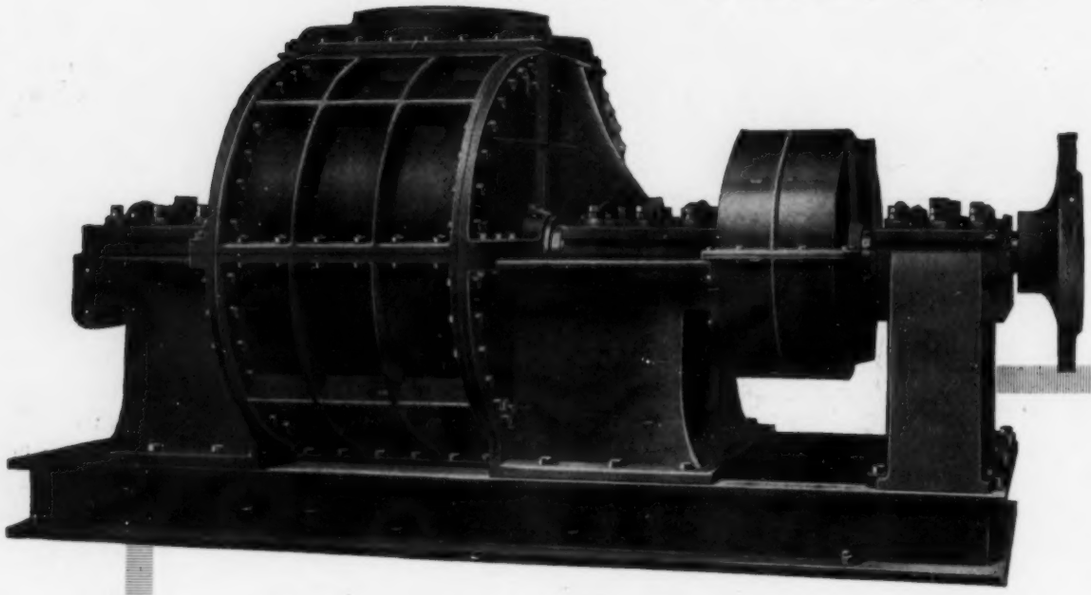

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Efficient in Operation—
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Exhausters and Boosters

Connersville Gas Pumps are so constructed that they will run continuously for years on their self-oiling gears and journals, with very little depreciation in efficiency, and with practically no repairs.

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They can be used for handling air, gas, steam, etc.

Built for any capacity from 25 to 40,000 cu. ft. per minute, and for any pressure between one-half and ten pounds.

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NEW YORK
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THE IRON TRADE REVIEW

Vol. LXIII Cleveland, October 3, 1918 *No. 14*

Pershing's Demands Crowd Mills

Forward Rush of Allies Causes Original Deliveries on Huge Tonnage of Military Supplies to be Cut in Half—Mills Respond With Remarkable Records—Lines on Distribution Drawn More Tightly

TREMENDOUS demands made upon the iron and steel plants by the forward surge of American and allied armies are being answered in a way to astonish even the industry itself. Production in certain branches has been speeded up to an extent recently believed impossible of attainment. Delivery time for huge tonnages entering into supplies for the battle line has been practically cut in half in response to General Pershing's urgent advice that the opportunity for stupendous military results was at hand and must be seized. Material for shells, cranes, trucks, tanks, rails for military roads, portable track work and various other essentials of an attacking and mobile army now is being rushed through the mills to the exclusion of less vital needs.

Distribution Tightened

As a result of these abrupt rush demands upon the plants, the lines covering the general distribution of steel have been more sharply drawn. As the situation has developed, it has been made clear that only a scanty amount of material will be available at this time for needs in the B and C classes. The mills have been instructed to insist rigidly that every formal detail in the way of providing proper priorities and affidavits shall be complied with by the consumer on his own initiative. Heretofore considerable latitude has been shown consumers by the producers in helping them to get through tonnage where it was known it was of an essential character. Consumers with orders taking a class C rating, it is said, will have small chance of these being filled. Their only recourse is to get these elevated to higher ratings if possible. It has also been definitely decreed that the automatic priority of A-5 applied to government work cannot be extended beyond the first subcontract. All these more stringent measures are to more thoroughly insure that the A class requirements, or those of the most vital character shall be filled with the greatest dispatch. As an example of its enlarged needs, the government has informed makers that it requires 140,000 tons of plates weekly or 20,000 to 25,000 tons more than the recent rate of output.

The temper of the producers and of their employes as well, is exemplified by the manner in which an advanced order for 40,000 tons of rails for the American expeditionary forces was handled at Pittsburgh. Cabled demands for immediate shipment of these rails were communicated to the mill management Saturday afternoon after the men had gone home. Hurry calls immediately were sent out and the mill crews reassembled. Before daylight Sunday morning, shipments were moving toward their overseas desination. Recently the same mill filled a speeded-up requisition for 20,000 tons of rails.

A new angle to develop in the price concession to the farming implement manufacturers is that since the arrangement is confined to requirements for the present manufacturing season, influential producers take the position that old undelivered tonnage put on their books months back, is subject to cancellation. Since many of these old contracts are at comparatively low prices, the buyer stands to lose this advantage in order to secure deliveries on the new basis.

Iron Pledge is Asked

The shortage in pig iron supply is causing an individual pledge to be asked from all consumers that every ton shall be devoted to essential purposes. This is in harmony with the government's aggressive efforts to conserve and increase the amount of iron available for prime necessities.

The railroad administration has taken a census of unfilled orders on mill books for standard rails for domestic roads. It is proposed to redistribute this tonnage among the different roads so that the pressing requirements of all may be satisfied. On the face of the present orders, some roads which bought early and freely would have received more than their proportionate amount.

OCTOBER 3, 1918

THE IRON TRADE REVIEW

A weekly publication devoted to the Iron, Steel, Foundry and Metal-working Industries

Published Every Thursday by
THE PENTON PUBLISHING CO., Cleveland

BRANCH OFFICES

CHICAGO - - - - - 1147 Peoples Gas Bldg.
CINCINNATI - - - - - - 128 Opera Place
NEW YORK - - - - - 2203-2206 St. Paul Bldg.
PHILADELPHIA - - - - - 1316 Land Title Bldg.
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Subscription, United States and Mexico, $4 per year. Canada $5, and other Foreign Countries, $8 per year.

Entered at the Postoffice at Cleveland as Second Class Matter

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American Chemistry Awakens

ONE of the most important of the many economic by-products of the war has been the evolution of the science of chemistry into the industrial stage. Four years ago Germany turned loose the laboratory as well as the workshop and arsenal. Since then allied science has been combatting German science, step for step. Not only is this true of the poison gases, but of the various great industries, which rely upon chemistry as a fundamental.

In the iron and steel industry, the needs of war have called for growing quantities of special steels. The use of tungsten steel has doubled the capacity of the country's machine shops. The various kinds of munitions and classes of war preparations call for steels of analyses particularly adapted for that work. Thus manganese steel, containing 12 to 14 per cent manganese, makes a tough hard steel such as is used in mining and grinding machinery: chromium makes hard tool steel; molybdenum is used for steel for lining large guns; vanadium makes strong steel which resists shock extremely well, as when used for automobile axles; silicon steel, which forges well; then there are elements sometimes introduced into steel in the form of ferroalloys, to impart special properties, such as titanium, uranium and boron. Better known alloys, however, are ferromanganese, used as a deoxidizer in making low carbon steel; spiegeleisen, used for the same purpose with higher carbon steels; and ferrosilicon which is also a deoxidizer and is particularly useful in making steel castings. Some of these industries have reached large proportions in the United States. The war has stimulated them to the growth of many years in the past few years. This progress was shown clearly at the Fourth National Exposition of the Chemical Industries at the Grand Central Palace, New York, last week.

Before the war America had many flourishing chemical industries, because of its wealth in coal, in vegetable and animal oils and fats and in fibres of useful character, but the supremacy of the world in coal tar dyes and synthetic medicines was passively acknowledged as belonging to Germany. The same supremacy prevailed in many of the rare metals and in some of the ferroalloys. But now conditions have changed entirely. The first chemical exposition had 83 exhibitors and an attendance of 63,000. This last, the fourth, had over 350 exhibitors and an attendance of over 100,000. The growth of these expositions has reflected not only the increased interest of the scientist, but also the awakening of the business man, the financier, the investor and the general public to the general subject of chemistry as a national industry and a national resource.

Put Deliveries Up to Uncle Sam

DELIVERIES when and how, are matters of chief concern to both machine tool dealer and user. This has been particularly true since the government assumed control of the railroads and with them the coastal shipping of the country. The railroad administration has absolute jurisdiction as to how a shipment shall be routed and while dealers and users all have their favorite routes, it is becoming more and more necessary to forego these as a war measure. It now is not considered patriotic to specify by what route a shipment shall be made. It practically is useless anyway since circumstances alter cases and the railroad administration makes use of the delivery that is possible at the time the shipment is going through. It has to be governed largely by the embargoes that then are extant.

That is why a Michigan user of machine tools recently received his equipment from a Cleveland dealer via an altogether different route than his favorite—the one he had specified. When the dealer's truck driver endeavored to unload the crates at one freight platform, he was told that an embargo on lines west had been ordered and that

embargo on lines west had been ordered and that that railroad could not accept the shipment. After another unsuccessful effort at another depot, the shipment was finally accepted by a third railroad.

Another shipment was ordered via a certain railroad from an eastern tool builder. Weeks passed and nothing was heard of the shipment. All efforts to trace it failed. The machines were needed in war work in some midwestern city, and their location became a vital necessity. Finally a lake transit company telephoned this dealer that a certain shipment was awaiting his direction on its docks. It developed the fact that the missing shipment had come to an important half way point and then on by rail.

That time is required to reach that degree of perfection in the conduct of the gigantic operations of the railroad administration, where all these things will work smoothly, is of course patent. In the meantime, the best thing for the machine tool user and dealer to do, if the various blanks on the order and on the bill of lading MUST be filled out, is to specify "via best possible route."

Violating Sound Economics

A SUBSCRIBER to THE IRON TRADE REVIEW numbered among the class of the smaller manufacturing consumers asks a question which has been raised recently in the minds of many buyers of iron and steel and still remains without a satisfactory answer. This is as to the occasion and justification of the special price concession in steel allowed to the farming implement industry.

This manufacturer says:

> Why should the farmer thus be favored over all other classes? Federal banks loan him working capital and our government guarantees him a profit or minimum selling price. He is accorded more credit than any other class considering his resources. We small manufacturers have to compete with the big ones and if we ask for financial help to handle a hard-earned contract, we are ignored altogether. But a small percentage of farmers pay any income tax. Farm products are higher than ever known in history, yet the farmer is buying fewer bonds and contributes less to the Red Cross than any other man. Scarcely any farmers have enlisted for service, but a large number of men in essential manufacturing have done so. One-third of our employes have either enlisted or been drafted, yet we have been unable to secure exemption for a single man, although we are doing essential work. Every farmer, to our knowledge, has been exempted.

There is much to justify what this manufacturer says. The concession to the farmer in the price of his implements made to the exclusion of all other consumers of iron and steel is contrary to sound economic principle and unfair in its practical application. The theory that the farmer is entitled to special and tender consideration which has become imbedded so firmly in the politic-legislative mind, in the end is as injurious to the farmer himself as it is contrary to the fundamental institutions of the country. It tends to delay the hoped-for day when all agriculture shall be lifted to a higher business plane.

Give the Small Shop a Chance

IN considering the mechanical achievements due to American genius the thoughts of the average man generally center on the large plant covering hundreds of acres of ground and employing thousands of men. That these immense industrial concerns are fitting monuments of highly developed business organizations, no one denies but why ignore the small shop?

The small machine shops are, today, in a peculiar situation. Not being in a position successfully to compete for large government contracts, the majority of them are compelled to confine their efforts to nonessential work with the ultimate prospect of being closed down entirely. Again, they are not able to compete for skilled labor with these larger concerns, which working on a cost-plus basis, with Uncle Sam footing the bills, are in a position to offer attractive wages.

The small shop has done much toward mechanical development in general, to say nothing of turning out the majority of skilled mechanics, many of whom eventually rise to hold responsible positions. For these reasons, every effort should be taken to insure the small shop an existence.

Urges Industrial Exemptions

PROVOST Marshal General Crowder's message to the employers of the United States calling on them to assist him in the equitable enforcement of the selective service law, the substance of which is printed elsewhere in this issue of THE IRON TRADE REVIEW, sheds new light on a phase of the administration of the law with which few were actually acquainted. The impression in some quarters has been that employers were too anxious to seek exemption for men whom they could spare for the army, that they were too selfish. Now comes General Crowder and points out that of 3,000,000 registrants called in the first draft approximately 5 per cent asked exemption on industrial grounds. The fact is that employers were so willing to sacrifice their own interests that the provost marshal has found it necessary to call on them to inform local boards in every instance where they are unable to spare a man. In other words, General Crowder says to the employers of the nation: "Consider the army in the field first, but don't forget the army at home."

Iron and Steel Prices

Corrected to Wednesday Noon

SCRAP, WAREHOUSE AND IRON ORE PRICES ON Page 810

PIG IRON

Bessemer, valley	$35.20
Bessemer, Pittsburgh	36.60
Basic, Pittsburgh	34.40
Basic, eastern Pa.	36.60
Basic, Buffalo	33.00
Malleable, Pittsburgh	35.90
Malleable, Chicago	34.50
Malleable, Buffalo	34.50

GOVERNMENT SCHEDULE

1.75 to 2.25 silicon (No. 2 foundry, No. 2 plain, and No. 3 southern), $34 furnace base.

2.25 to 2.75 silicon (No. 2X, No. 1 Northern foundry, and No. 2 southern), base plus $1.25.

2.75 to 3.25 silicon (No. IX), base plus $3.00.

Over 3.25 silicon, $37.00, plus $1.00 for each ½ per cent of silicon.

No. 1X, Phila.	40.60
No. 2 foundry, Pittsburgh	35.40
No. 2 foundry, Cleveland	34.00
No. 2 foundry, Ironton	34.00
No. 1 foundry, Chicago	35.25
No. 2 foundry, Chicago	34.00
No. 2X foundry, Phila.	38.85
No. 2X foundry, N. J. tide	39.05
No. 2X foundry, Buffalo	35.25
No. 2 plain, Philadelphia	37.40
No. 2 plain, N. J. tide	37.80
No. 2 southern, Birmingham	35.25
No. 2 southern, Cincinnati	38.85
No. 2 southern, Chicago	40.25
No. 2 southern, Phila.	41.85
No. 2 southern, Cleveland	40.25
No. 2 southern, Boston	42.75
No. 2 southern, St. Louis	39.50
Virginia, No. 2X, furnace	36.75
Virginia, No. 2X, Phila.	41.75
Virginia, No. 2X Jersey City	42.75
Virginia, No. 2X, Boston	42.95
Gray Forge, Pittsburgh	34.40
Silveries, 8 per cent, furnace	47.50
Silveries, 8 per cent, Chicago	51.50
Low phos. standard, Phila.	57.00
Low phos. Lebanon, furnace	51.00 to 53.00
Low phos. Pittsburgh standard	54.40
Charcoal, Superior, Chicago	38.70 to 39.70
Charcoal, Superior, Buffalo	38.50
Charcoal, southern to 2 per cent silicon	51.00

COKE

(At the ovens)

Connellsville furnace	$6.00
Connellsville foundry	7.00
Pocahontas furnace	8.00
Pocahontas foundry	8.00
New River foundry	8.00
New River furnace	8.00
Wise county furnace	7.25
Wise county foundry	8.25

FERROALLOYS

Ferromanganese, 70 per cent delivered	250.00
Spiegel, 16 per cent fur., spot	75.00
Spiegel, contracts, furnace	75.00
Ferrocarbon, titanium, carloads, maker's plant	200.00
Ferrosilicon, 50 per cent, spot and contract, delivered	152.50 to 165.00
Bessemer ferrosilicon, 10 per cent	57.00
Bessemer ferrosilicon, 11 per cent	59.30
Bessemer ferrosilicon, 12 per cent	63.00

Ferrosilicon prices at Ashland, Ky., Jackson and New Straitsville, O.

SEMIFINISHED MATERIAL

BILLETS AND BLOOMS

Open-hearth, Pittsburgh	$47.50
Open-hearth, Philadelphia	51.30
Open-hearth, Youngstown	47.50
Bessemer, Pittsburgh	47.50
Bessemer, Youngstown	47.50
Forging, Pittsburgh	60.00
Forging, Philadelphia	63.80

SHEET BARS

Open-hearth, Pittsburgh	$51.00
Open-hearth Youngstown	51.00
Bessemer, Pittsburgh	51.00
Bessemer, Youngstown	51.00

SLABS

Pittsburgh and Youngstown	$50.00

WIRE RODS AND SKELP

Wire rods, Pittsburgh	$57.50
Grooved skelp, Pittsburgh	2.90c
Sheared skelp, Pittsburgh	3.25c

SHAPES, PLATES AND BARS

(In cents per pound)

Structural shapes, Pitts.	3.00c
Structural shapes, Phila.	3.23c
Structural shapes, N. Y.	3.245c
Structural shapes, Chgo.	3.27c
Tank plates, Chicago	3.52c
Tank plates, Pittsburgh	3.25c
Tank plates, Philadelphia	3.48c
Tank plates, New York	3.495c
Bars, soft steel, Pittsburgh	2.90c
Bars, soft steel, Chicago	3.17c
Bars, soft steel, New York	3.145c
Bars, soft steel, Phila.	3.13c
Bar iron, Phila.	3.73c
Bar iron, Chicago	3.50c
Bar iron, Cleveland	3.67c
Bar iron, New York	3.745c
Bar iron, Pittsburgh	3.50c
Hard steel bars, Chicago	3.00c

RAILS, TRACK MATERIAL

Angle bars, Pittsburgh base	3.25c
Angle bars, Chicago base	3.25c
Standard bessemer rails, mill	$55.00
Stand. open-hearth rails, mill	57.00
Light rails, 25 to 45, mill	3.00c
Relaying rails, Light, St. L.	60.00 to 67.00
Spikes, railroad, Pitts.	3.90c
Track bolts, Pittsburgh	4.90c
Track bolts, Chicago	5.115c
Tie plates, Chicago	3.25c

WIRE PRODUCTS

(Per 100 lbs. to jobbers; retailers 5c more)

Wire nails, Pittsburgh	$3.50
Coated nails, Pittsburgh	3.45
Plain wire, Pittsburgh	3.25
Galvanized wire, Pittsburgh	3.95
Polished staples, Pittsburgh	3.65
Galvanized staples, Pittsburgh	4.35
Barb wire, painted, Pitts.	3.65
Barb wire, galvanized, Pitts.	4.35
Cut nails, Pittsburgh	5.00

CHAIN, PILING, STRIP STEEL

(In cents per pound)

Chain, 1 in. proof coil, Pitts.	7.50c
Sheet piling, base, Pitts.	4.00c to 5.00c

Cold rolled strip steel, hard coils, 1½ inches and wider by 0.100 inch and heavier, base per 100 pounds, 6.50c.

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SHEETS

(In cents per pound)

SHEET MILL BLACK

No. 28, open-hearth, Pitts.	5.00c
No. 28, bessemer, Pitts.	5.00c
No. 28, open-hearth, Chi.	5.27c

TIN MILL BLACK

No. 28, open-hearth, Pitts.	5.00c
No. 28, bessemer, Pitts.	5.00c

GALVANIZED

No. 28, open-hearth, Pitts.	6.25c
No. 28, bessemer, Pitts.	6.25c
No. 28, open-hearth, Chi.	6.52c

BLUE ANNEALED

No. 10, open-hearth, Pitts.	4.25c
No. 10, bessemer, Pitts.	4.25c
No. 10, open-hearth, Chi.	4.52c
No. 10, open-hearth, Phila.	4.48c

TIN PLATE

(Per 100 lb. box)

Tin plate, coke base, Pitts.	$7.75

IRON AND STEEL PIPE

Base Pittsburgh

Base, Pittsburgh	Black Per cent off	Galv. Per cent off
⅜ to 3 in., butt, steel	51	37½
¾ to 3 in., butt, iron	33	17

BOILER TUBES

Steel, 3½ to 4½ inches, l. c. l.	30
Iron, 3½ to 4½ inches, c. l.	12½

CAST IRON WATER PIPE

Without War Freight Tax

(Class B Pipe)

Class A pipe is $1 higher than Class B.

Four-inch, Chicago	69.80
Six-inch and over, Chicago	66.80
Four-inch, New York	70.70
Six-inch and over, N. Y.	67.70
Four-inch, Birmingham	63.00
Six-inch and over, Birmingham	60.00

HOOPS, BANDS, SHAFTING

Hoops, Pittsburgh	3.50c
Bands, Pittsburgh	3.50c
Hot rolled strip steel, Pitts.	3.50c
Hot rolled strip steel, Pitts. stamping quality	4.00c
Shafting, Pitts., carloads	17 off to list
Cotton ties, Oct., per bundle	$1.96

RIVETS

Structural rivets, Pittsburgh	4.40c
Boiler rivets, Pittsburgh	4.50c
Rivets ⅞ in. and small., Pitts.	50 and 10 off

NUTS AND BOLTS

(Prices f. o. b. Pittsburgh)

CARRIAGE BOLTS

(⅜ x 6 inches, smaller and shorter)

Rolled thread	50-5 off
Cut thread	40-10-5 off
Larger and longer	40 off

MACHINE BOLTS

(⅜ x 4 inches, hot pressed nuts)

Rol'ed thread	50-10-5 off
Cut thread	50-5 off
Larger and longer	40-10 off
Cold pressed semifin'shed hexagon nuts ⅝ in. and larger	60-10-10 off
Cold pressed semi'fin'shed hexagon nuts ⅞ in. and smaller	70-5 off
Gimlet and cone point lag screws	50-10 off

NUTS

Hot pressed, square blank	2.50c off
Hot pressed, square tapped	2.30c off
Hot pressed, hexagon blank	2.30c off
Hot pressed, hexagon tapped	2.10c off
Cold pressed, square blank	2.25c off
Cold pressed, square tapped	2.00c off
Cold pressed, hexagon blank	2.25c off
Cold pressed, hexagon tapped	2.00c off

Prices Present and Past

(Yesterday, a month ago, three months ago and a year ago)

Quotation on leading products October 2, average for September, 1918, average for July, 1918, and average for October, 1917. Prices are those ruling in the largest percentage of sales at the dates named.

	Prices Oct. 2, 1918	Average prices Sept. 1918	July 1918	Oct. 1917
Bessemer pig iron, Pittsburgh	$ 36.60	$36.60	$36.60	$37.25
Basic pig iron, Pittsburgh	34.40	33.40	33.40	33.95
*No. 2 Foundry pig iron, Pittsburgh	35.40	34.40	34.40	33.95
*No. 2 Foundry pig iron, Chicago	34.00	33.00	33.00	33.00
Lake Superior charcoal, Chicago	38.70	37.70	37.50	37.50
Malleable, valley	34.50	34.90	34.90	35.20
Malleable, Chicago	34.50	33.50	33.50	33.50
**Southern, No. 2, Birmingham	35.25	33.50	33.50	33.00
*Southern Ohio No. 2, Ironton	34.00	33.00	33.00	33.00
Basic, eastern Pa.	36.60	32.00	32.00	33.00
**No. 2X Virginia, furnace	36.75	33.50	33.50	33.50
**No. 2X foundry, Philadelphia	38.85	34.50	34.50	34.25
Ferromanganese, 70%, delivered	250.00	250.00	250.00	285.00
Bessemer billets, Pittsburgh	47.50	47.50	47.50	58.75
Bessemer sheet bars, Pittsburgh	51.00	51.00	51.00	65.50
Open-hearth sheet bars, Pittsburgh	51.00	51.00	51.00	65.50
Open-hearth billets, Pittsburgh	47.50	47.50	47.50	58.75
Steel bars, Pittsburgh	2.90	2.90	2.90	2.90
Steel bars, Chicago	3.17	3.17	3.17	2.90
Iron bars, Philadelphia	3.73	3.73	3.73	4.935

*1.75 to 2.25 silicon. **2.25 to 2.75 silicon

	Prices Oct. 2, 1918	Average prices Sept. 1918	July 1918	Oct. 1917
Iron bars, Cleveland	$ 3.64	$ 3.64	$ 3.64	$ 4.50
Iron bars, Chicago mill	3.50	3.50	3.50	4.50
Beams, Chicago	3.27	3.27	3.27	3.00
Beams, Pittsburgh	3.00	3.00	3.00	3.00
Beams, Philadelphia	3.23	3.23	3.23	3.185
Tank plates, Pittsburgh	3.25	3.25	3.25	3.25
Tank plates, Chicago	3.52	3.52	3.52	3.25
Tank plates, Philadelphia	3.48	3.48	3.48	3.435
Sheets, blk., No. 28, Pittsburgh	5.00	5.00	5.00	7.75
Sheets, blue anld., No. 10, Pittsburgh	4.25	4.25	4.25	7.87
Sheets, galv., No. 28, Pittsburgh	6.25	6.25	6.25	8.81
Wire nails, Pittsburgh	3.50	3.50	3.50	3.87
Connellsville furnace coke	6.00	6.00	6.00	6.00
Connellsville foundry coke	7.00	7.00	7.00	6.00
Heavy melting steel, Pittsburgh	29.00	29.00	29.00	31.50
Heavy melting steel, eastern Pa.	28.50	28.50	28.50	26.00
Heavy melting steel, Chicago	29.00	29.00	29.00	27.00
No. 1 wrought, eastern Pa.	34.00	34.00	34.00	36.75
No. 1 wrought, Chicago	33.50	33.50	33.50	35.50
Rerolling rails, Chicago	34.00	34.00	34.00	36.00

(For additional prices see page 810.)

Greater Iron Output Now in Sight

Co-operation of Government Agencies Expected to Bring Early Results—September May Make Record—Transportation Factor Now Minimized—Allocating Iron for Semisteel Shell Program—Distribution More Fully for Urgent Needs

Pittsburgh, Oct. 1.—Distribution of pig iron tonnages is now practically 100 per cent for governmental needs. Some inquiries are coming to blast furnace interests but these are usually small and represent the piecing-out of requirements. Such demands get no attention from the furnacemen, who usually direct buyers to Washington. Not only is distribution more directly under control of the government, but production also is getting full attention from the authorities. As the result of the co-operation of the fuel administration and the labor administration, it is believed that a materially larger output of iron is at hand. It is believed that September production will make the best showing in several months and as many furnaces which have been down for repairs or for relining will go into blast within the next few weeks, it is thought likely that the present month will make a record. There seems to be complete satisfaction among pig iron interests here with the prices recently made and those who attended the conference in Washington on Sept. 23, expressed great surprise over the dearth of complaint relative to railroad service. Time was when a small gathering of blast furnacemen would bring forth general criticism of transportation conditions. At the Washington meeting there was only one complaint and this was of minor importance.

Advance Doesn't Help

Buffalo, Sept. 30.—The increase in the price of pig iron will not redound materially to the benefit of the furnaces in this district, it is believed. And at least furnacemen do not anticipate as good a situation as a year ago, notwithstanding the increase. They say that the increase of 25 cents in the price of ore will take 50 cents of the $1 increase per ton of iron, and that the labor awards which presently will be fixed in the coke and coal trades, will eat up the remaining 50 cents and more, too. But the general attitude of furnacemen is not a complaining one. They realize that the war must be won, whatever the consequence to any particular industry. Coke shipments are beginning to come in a little better and the quality is slightly improved, but the industry looks for a bad winter as to fuel supply. The quality of the coke has been wretched up until a short time ago when the government took drastic action to improve it. Furnacemen say that the coke supply will be the biggest factor in the output this winter. Considerable 1919 selling has been going on and two interests here are said to be sold up for the first half subject to new allocations. There have been recent instances in this district where the government has given furnaces orders for work which they did not have on their books. Allocating is going on steadily.

Net Virginia Prices Highest

New York, Sept. 28.—When the new price schedule in pig iron becomes effective on Oct. 1, the net prices at a few furnace districts when shipping No. 2 foundry iron to New York and Brooklyn will be as follows: Virginia, $37.10; Lebanon valley, $35.50; Schuylkill valley, $35.80; Lehigh valley, $35.60; Juniata valley, $34.50. The net prices in the same

districts when shipping to Newark, N. J., will be as follows: Virginia, $37.10; Lebanon valley, $34.20; Schuylkill valley, $35.20; Lehigh valley, $35.50; Juniata valley, $33.20. Thus, the Virginia furnaces enjoy the highest net furnace price when shipping to the metropolitan district at the same delivered price as Pennsylvania iron. Allocations of foundry and low phosphorus iron made up nearly all of the business placed in this district during the past week. Included in the foundry allocations was some additional tonnage for the Brooklyn navy yard for first half shipment. An interesting point resulting from the increased prices which become effective Oct. 1, has been raised with regard to orders for pig iron placed by the navy department. Originally, the navy requirements in all cases have been allocated, after which the navy department has insisted that the furnaces sign contracts specifying the tonnage and the price to be paid. The latter naturally was the government's price then in effect. Since these contracts were not in accordance with the agreement of the iron and steel institute with the price fixing committee, which provided that contracts calling for delivery after Sept. 30, should be given the government price prevailing at the time shipment was made, the producers concerned, who signed the contracts only at the navy department's insistence, feel that these contracts should be readjusted.

Seek Pledges From Consumers

Cleveland, Sept. 30.—Consumers of pig iron are being asked by the furnaces to pledge themselves to devote iron in their possession only to the advancement of essential work. A circular letter now being sent to the producers by the committee on pig iron, iron ore and lake transportation calls upon the former to secure these pledges from their customers. Allocations continue large. Malleable foundries are beginning to request metal of that grade for first quarter delivery which is to be devoted to the production of semisteel shell contracts which recently have been arranged for by these plants. Considerable of the 2400 tons of malleable included in the week's allocations was for this purpose. Foundry iron demands upon the committee continue large, 21,000 tons of this grade having been distributed. The remainder of the week's distribution consists of 16,000 tons of low phosphorus, of which 13,000 tons is for delivery over the first half of 1919 and 14,000 tons of basic. The week's total was 53,400 tons, making the grand total of allocations since May 1, 1,105,000 tons. New requirements put up to the committee through the steel director are large. At present from 50,000 to 100,000 tons are pending. Less coke trouble is reported by the furnaces in this district. Local users of foundry iron appear to be better supplied to the extent of their essential business and few complaints from that source now are being heard.

Advance Will Change Mixtures

St. Louis, Sept. 28.—The principal item of interest in the pig iron situation here has been the advance in price resulting from the agreement between the iron and steel interests and the war industries board. Among producers considerable satisfaction is felt, and consumers are in the position of being so anxious for iron that they are willing to pay almost any price and not complain much. Opinion differs as to the justice of the blanket advance, it being pointed out that many furnaces were doing extremely well in the matter of earnings on the old schedule. All recent sales, under terms of contract, will carry the advance, so that producers generally will derive the full benefit. Some well posted members of the trade in this district declare the advance will mean a tremendous upheaval in this general region, particularly to the west. An absolute change in foundry practice is predicted, as it will necessitate the use of new iron by foundries which have always drawn their supplies from certain localities. Southern iron to foundries at Kansas City will cost $6 more than heretofore, which is virtually prohibitive. It will be cheaper for these plants to purchase a higher grade iron in the north. The south always has been the principal source of supply for this section. The demand is overwhelming. Deliveries are excellent, and war plants are working at capacity.

Iron Figures Delayed

OWING to the extraordinary mechanical requirements occasioned by this special edition of THE IRON TRADE REVIEW, *issued in connection with the Allied Metals Congress in Milwaukee, Oct. 7 to 12, it was found necessary to advance the press date of this number by one day. This has made it impossible to complete in time for publication the monthly blast furnace statistics regularly compiled by* THE IRON TRADE REVIEW. *These statistics under normal circumstances would have appeared in this issue. They will now be presented in the Oct. 10 issue. The present number of* THE IRON TRADE REVIEW *contains 420 pages and is the largest issue ever put out by this publication excepting the annual issues of the past several years.*

Better Feeling Is Noted

Birmingham, Ala., Oct. 1.—A better feeling is noted in the pig iron market in southern territory. The recent advance of $1 per ton on foundry and basic irons for the fourth quarter of the year will effect a number of sales previously made with the understanding that the prevailing price at delivery would apply. Inquiries still are very strong but practically all of the business that is being accepted is that being allocated to this section by the government. Production promises to show steady gains in Alabama as furnace improvement is being given attention. The Republic Iron & Steel Co. is making preparations to gather up some ore accumulated from the Spalding mines, near Birmingham, during the dull period, more than two years ago. This company will blow in its third furnace at once. The Alabama Co. now is in position to re-establish its former supplies of coke and fuel. It may resume operations at the second Gadsden furnace. The Sloss-Sheffield Steel & Iron Co. may start its sixth furnace before long. Other preparations have been made for increased production.

Discuss New Price Schedule

Philadelphia, Oct. 1.—American Pig Iron association held a meeting here last week to discuss the new price schedule and also the 8-hour basic day. Nothing yet has been done by eastern furnaces toward adopting the latter. Some furnaces under the new price schedule will adhere to method of quoting a net furnace price computed by adding the base price to freight from basing point to destination and subtracting freight from furnace to destination. Thus consumers will pay war tax on freight rates. Very little selling is being done as indications are that all production will be allocated before long. Good sized allocations were made during the past week. These were mainly for foundry iron and there was undivided at least 15,000 tons of low phosphorus for first half delivery.

Contract Deliveries Late

Chicago, Oct. 1.—Producers of pig iron are falling steadily behind on deliveries on account of large allocations by the government for essential purposes. One important maker

is about 150,000 tons behind schedule on deliveries on regular contracts. This is equal to almost two months production and this is a fair representative of the entire situation. Selling for the 1919 delivery continues to be done and probably two to three months production has been contracted already. Southern producers are not in the market and even the announcement of new prices for last quarter, indicating that better figures are to be realized on first half sales, has not tempted them to open their books. Less iron is coming from the south than formerly, shipments of high sulphur being considerably reduced. Readjustment of prices in accordance with the most recent announcement is taking up most attention and with better understanding of the new situation, the increased rates are better appreciated than at first.

Form Post-War Committee

President W. H. Finley of the American Association of Engineers announces the appointment of a committee of prominent engineers to study after-the-war conditions. The committee consists of Isham Randolph, chairman; Edmund T. Perkins, consulting engineer, Chicago; Gardner S. Williams, consulting engineer, Ann Arbor, Mich., and Samuel Morcell, Chicago, secretary. The committee will be increased as it gets into the work and will join forces with other agencies in Chicago and throughout the country that are now studying the problem. The after-the-war problem may be defined as the rebuilding on normal peace lines of the activities, mental and physical, which prevailed before the war. It begins primarily with the returning soldier, in his rehabiliation and his return to the industry which best suits his capacities and desires. It includes the placing of other war workers as conditions change and of any human effort where it may be most effective. It means better use of natural resources in lands, minerals, waters and forests, to furnish larger and more nearly equal opportunities for each citizen and the placing of industry including agriculture, mining and transportation on a basis to meet the changed needs of the country.

Housing statistics obtained from England through the bureau of labor statistics, department of labor, show that $5,295,564.71 has been expended there by the ministry of munitions for housing 19,565 workers. In all, about $14,000,000 has been expended by the ministry for war housing.

Expect Big Coke Output

Believed October Will Make Good Showing—Carnegie By-Product Ovens Operating Heavily—Supplies Generally Are Easier

Pittsburgh, Oct. 1.—Hope runs strong that the recent decline in coke output in the Connellsville region was merely a temporary lapse. Late reports from the region suggest some recovery and it occasions no great surprise that the coming month is making the best showing of any in some time. Not only is the weather unusually favorable for operations in October, but it is pointed out there are only four Sundays, thus permitting of 27 days' work. Less complaint is being heard about the quality of the fuel being provided from the Connellsville region, and if production could be brought up to about 375,000 tons a week the cup of the blast furnace interests would be full to overflowing. As matters stand, however, the blast furnaces are getting only sufficient fuel to keep them going, and if suspension is to be rendered unnecessary, it will be essential to keep coke moving steadily from the ovens. The car supply is reported to be 100 per cent and now that the fuel and railroad administration are co-operating it is believed that any shortages that may crop up from time to time will be of short duration. Seven batteries of 64 ovens each of the Clairton by-product coke plant of the Carnegie Steel Co., have been in during the past week, but the starting of the eighth, ninth and tenth batteries is held up by lack of coal, although the ovens are ready for operation. Coke production in the Connellsville region for the week ended Sept. 21 was 339,475 tons, compared with 348,330 tons the previous week, according to the *Connellsville Courier*.

Close Next Year Contracts

St. Louis, Sept. 28.—Aside from a fair volume of contracting for first half of 1919 requirements, the coke situation here during the past week has been featureless and unchanged. All of this business has been done on a basis of consumption for the corresponding period this year, no provision having been made for increased needs. Shipments from the east are coming along well, and quite a number of consumers claim to have found an improvement in quality since the new regulations providing a fine for inferior outputs. The west has been faring much better in the matter of shipments of foundry coke, but there is still room for much further improvement. By-product plants in the district are maintaining their recent record but all are well sold into the future and are offering nothing.

Working For Improvement

Birmingham, Ala., Oct. 1.—Coal and coke producers in the south are working incessantly for an improvement in production though statistics up to the last week have not been so encouraging. In Alabama the fuel administration reported an output at the mines for the week ending Sept. 21 of 383,142 tons against 385,621 tons for the week ending Sept. 14. The loss in output is accounted for in the shut down of the Lewisburg mines of the Alabama Co., where a cloudburst several weeks ago caused so much havoc. The car situation is beginning to show some improvement. Production committees have been named at many of the mining camps and records will be kept of the time being given to work by employes. It is now believed that the production soon will reach not less than 425,000 tons weekly in Alabama and coal will be more plentiful for both coke production and domestic consumption. The coke producers are looking to only the filling of orders in hand. The Alabama Co. has started its ovens again in full.

Reduced Supply

Of Steel Now Going to Tin Plate Mills—Await Orders

Pittsburgh, Oct. 1.—Tin plate manufacturers still are awaiting the new order relative to shipments of tin plate for containers for dried beans and other nonperishable foods. Mills the past week have continued to operate comparatively full, but starting today, the allotments of steel to the tin plate mills go to a basis of 70 per cent capacity operations. As the tin plate requirements for perishable foods have been amply covered no great hardship is expected in getting the mills down to this basis. Some fear exists that it may be found necessary to still further curtail the allotment of sheet bars for tin plate, not because of a greater need of steel for other purposes, but because it has been found that some makers of containers are oversupplied.

Scrap Shortage Tightens

All Grades More Difficult to Secure—Rejections Reduced Accordingly —More Turnings Permits Issued—Pennsy Offers List

For complete scrap prices see page 810.

Chicago, Oct. 1.—Practically all grades of iron and steel scrap are becoming scarcer. Dealers have an open abyss of demand into which all tonnages they can obtain are poured without making an impression. Consumers are ready to take all offerings and much substituting is done. Users are being forced to accept other than the usual grade, in order to obtain sufficient amount for their operations. Quotations are nearly all at the maximum prescribed by the war industries board and there is little question of price. Commissions are being paid by practically all consumers, those who held out against this practice having been forced in because of inability to obtain their needs without conforming to the practice. Railroad offerings are scarce The Chicago & Northwestern has issued a list of 5000 tons, including 500 tons each of No. 1 wrought, re-rolling rails and mixed wrought and steel and 200 tons of No. 2 wrought.

Turnings Permits Extended

New York, Sept. 30.—Certain iron mills in the east engaged in work for the Emergency Fleet corporation have received further permits to pay the advanced price of $2 on clean borings and turnings. According to an announcement last week by subcommittee on iron and steel scrap, no further permits were to be issued after Sept. 28 unless special conditions still warranted. Evidently, not all of mills have received sufficient material to tide them over the present shortage. The decision of the price fixing committee to leave quotations unchanged over the fourth quarter was in line with the expectations of the trade. Buying in the New York market continues to hold well with a good demand for virtually all descriptions.

Dealings Are Limited

Pittsburgh, Oct. 1.—Scrap dealers complain that there is little chance for them to do business because distribution is becoming more and more a governmental function and their best sources of supplies—the railroads and the steel mills—largely are shut to them. Best railroad scrap is going direct to the mills on governmental orders and mills supplies also move without passing through dealers' hands. Demand is big and if the supplies could be had dealers' sales would be huge. Bringing in supplies from outside points is hampered not only by increasing difficulty in securing permits, but also from the fact that supplies are not plentiful elsewhere and prices too high to permit of profitable importations. Rejections of scrap because of quality are few, so great is the demand for it. Nothing has been heard about the attempt on the part of some open hearth interests to secure an extension of the embargo on shipments of turnings to blast furnaces. The Pennsylvania will make awards of two large lots of scrap on Oct. 4, but dealers expect to get little of it, because of the government orders which make it incumbent on the railroads to give the steel mills preference.

Troubled Over Winter Supplies

Buffalo, Sept. 30.—The shortage of iron and steel scrap is becoming more pronounced, and mills are beginning to wonder where the heavy supplies of material which should be heaping up now for winter use, are going to come from. It looks at this time as if the conditions would be serious to say the least for some mills very soon. Present indications are that a regulation of scrap shipments must be established within the near future to maintain an even distribution of material. Supplies of heavy melting steel are very short. Though there is a tremendous amount of trading it is being done in small lots. There is very little opportunity of obtaining an idea of its volume. The car situation is about the same except that it is a little bit harder to obtain satisfactory transportation. It is necessary to obtain permits for a considerable portion of the shipments and the fact that the trade must resort to the permit system so early, does not augur well for the winter. Steel works are living hand to mouth so far as scrap is concerned and anything which goes to interrupt or retard these meager receipts will be an extraordinary source of irritation to them.

Think Shortage Magnified

Cleveland, Oct. 1.—Some scrap iron and steel dealers here contend that the much-talked-of shortage of scrap has not a great deal of foundation in fact. In former years, they point out, consumers would make two or three contracts covering their scrap needs for three or four months to come. Now, it is claimed, most dealers are selling in small lots only and because of government fixed prices are not anxious to contract. Accordingly, the dealers contend, the appearance of a great shortage is given, but consumers are getting enough scrap to keep them going and few have run markedly short of supplies. Practically without exception, every grade is in big demand, melting steel continuing in the lead as heretofore. It is expected that bona fide scrap yards here, with those in other districts, will be given a place soon in the essential grouping. Some talk is heard of government maximum prices being exceeded, but no definite evidence is put forward. The car situation is somewhat bothersome, gondolas being difficult to obtain at times. Reaffirmation of third quarter prices to extend over the fourth quarter has not precipitated a great amount of contracting inasmuch as it was felt all along that no price changes were contemplated.

Holding Off From Market

Birmingham, Ala., Oct. 1.—Southern scrap iron and steel dealers are holding off from selling at present prices as much as possible, confident there will be a demand for all the product they can offer a little later. Stocks are being accumulated. Consumers in this section are not inclined to pay the government maximum prices but there is hope among the dealers that a scarcity of scrap in the larger centers will bring some business this way and result in a higher market. Consumers of heavy melting steel still are maintaining that they are entitled to consideration as to freight rates. The scrap men of this district are waiting word from the national association as to construction of certain rulings at Washington.

Offerings Growing Less

St. Louis, Sept. 28.—A scarcity, bordering on famine, continues to feature the market for scrap. Unusually small tonnages have come into sight this week from any quarter. The railroads have not a single list out and the dribbling arrivals from the country are not sufficient to even partially relieve the stringency. All grades are in strong demand, and persons with something to dispose of find numerous purchasers ready to take it at top prices and commission. Dealers declare the inquiry does not

center in any particular grade but covers the entire list. Further, consumers are in no wise discriminating and accept consignments which in the past would have been rejected. Cast scrap enjoys popularity, the stove makers having open orders with their dealers for every ton that can be got at anything like a reasonable price. Rolling mill grades are also urgently wanted, with available supplies the lightest in many months. Yard stocks have dwindled and there is little likelihood of their being replenished in the near future. An inquiry for a sizable tonnage of relaying rails for export to Cuba was reported by a local dealer this week, but there is small chance of its being filled in this territory.

To Serve Essential Consumers

Philadelphia, Oct. 2.—Iron and steel scrap steadily is getting scarcer. Not only are yard stocks small but stocks at consuming plants are dwindling and many consumers have only a few days' supply on hand. As a result of this condition, a system now is being worked out by which most essential consumers will get their scrap first. Users here and there unable to get enough scrap for essential purposes continue to receive aid although only when absolutely necessary. Five iron mills that received permits to buy turnings at $21, delivered, now are well supplied.

Organize to Build Ships

To construct both steel and wooden vessels, a new shipbuilding plant will be established at once in Kewaunee, Wis., by the Wisconsin Shipbuilding & Navigation Corp., organized several months ago by a syndicate of Milwaukee and Wisconsin capitalists. The capital stock is $500,000. An option on a 40-acre tract of land, with a dockage of 2700 feet along the upper turning basin in the Kewaunee river, near its entrance into Lake Michigan, has been exercised and work will begin within the month on the first of six berths and a 600-foot drydock. The plant is being designed by H. B. Kamschulte, of Kamschulte & Webster, consulting engineers, Milwaukee. Among the principal stockholders in the Wisconsin company are the following Milwaukee manufacturers and business men: Theodore O. Vilter, head of the Vilter Mfg. Co.; Paul E. Thomas, president of the Kempsmith Mfg. Co.; George F. Gerlinger, of the Gerlinger Steel Castings Co.; Philip Schwab, of the Schwab Machine Co.; William W. Allis, W. H. Upmeyer, George T. Johnson, Albert Vogel and Albert O. Trostel.

Structural Awards Lean

Fabricating Shop Workers Attracted Into Shipbuilding Field—Many Small Military Spans Are Called for from Abroad

New York, Sept. 28.—New developments in the eastern structural market were comprised entirely of a few new projects which came up for bids. The largest of these calls was for 1100 tons for a cellulose plant to be erected at Cumberland, Md. No contracts were let during the week involving any tonnage of size. The feeling among eastern fabricators is that with commercial structural work no longer figuring in the market, and with government requirements rapidly dwindling, the fabricating field shortly will have only ship and railroad steel to keep it occupied. The changed conditions in the structural field of late have resulted in the transfer of great numbers of structural workers to the shipbuilding and other industries calling for skill of the kind they possess. But, owing to the lack of work, they are not missed in the structural industry at present. Orders for plain shapes also are dropping off and the business aggregated a comparatively small total in this district. The principal eastern makers continue to limit their shipments to A priority orders.

Entirely On Essential Work

Pittsburgh, Oct. 1.—Nothing but essential government work is getting any attention from the fabricators of steel. Between the demands of the Emergency Fleet corporation and necessary government buildings, capacity is fully occupied. Commercial construction is diminishing constantly. Fabricating plants for providing the needs of the Emergency Fleet corporation under construction by the McClintic-Marshall Co. at Leetsdale and Pottstown, Pa., are reported to be coming along according to schedule and are expected to be in use by the first of the year.

Meeting Pershing's Demands

Cleveland, Sept. 30.—Crane manufacturers in this district are speeding up production in a marked degree to satisfy requests for expedited deliveries recently made by General Pershing. The result is that heavier demands are being made upon the mills for shipment of material already on the books and this is being done to the exclusion of some other business. The district manufacturers commission which is the manufacturers organization organized in accordance with the district plan of the resources and conversion section of the war industries board is inquiring for 356 spans for small military bridges for shipment abroad.

Western Building Nil

Chicago, Oct. 1.—Building in the west requiring structural steel has been reduced to a minimum and tonnages of any size are absent. Most present construction takes only small lots of shapes and must be of an essential character to obtain even these small lots. The St. Paul Foundry has taken 272 tons for one of the buildings in the union station group at St. Paul, Minn. Three bids have been received on readvertisement for steel for part of the Michigan boulevard improvement in Chicago but no award has been made.

Place Ship Steel for Japan

Philadelphia, Oct. 1.—Structural inquiries now on the market embrace only small tonnages. The largest is some tonnage for signal bridges for the Pennsylvania railroad. Included in structural shape allocations last week and preceding week were from 55,000 to 65,000 tons for shipbuilding in Japan. This tonnage went in at the government price. Some car tonnage also is being allocated.

CONTRACTS PENDING

Boiler plant for government at Hampton Roads, Va., 200 tons, bids being taken.

Bridge at Boston for New York, New Haven & Hartford railroad, 500 tons, bids being taken.

Mess hall and barracks at Stevens Institute of Technology, Hoboken, N. J., 300 tons, bids being taken.

Cellulose plant at Cumberland, Md., 1100 tons; general contract awarded to George A. Fuller Co., bids being taken.

Roll Pershing Rails

Pittsburgh, Oct. 1.—In the week ending Sept. 16, mills No. 1 and No. 2 of the Edgar Thompson works of the Carnegie Steel Co. running exclusively on heavy rails for General Pershing, produced 16,362 tons. In the previous week these mills running partly on Pershing rails and partly on orders from other sources turned out 18,141 tons. The company is running on an order of 43,000 tons of heavy rails placed in August and in the two-week period therefore produced more than three-quarters of the tonnage. The output for the week ending Sept. 9 was the largest for any week this year, although considerably below the company's best record for a week's output.

May Cancel Bar Contracts

Concession to Implement Trade Interpreted to Mean Wiping Out of Old Low-Priced Orders—More Affidavits Called for

Cleveland, Sept. 30.—Cancellation of contracts for bars made before July 15 is involved according to the interpretation which leading producers have put upon the special concession of $5 per ton to the farming implement manufacturers. Since some of these old contracts were made months ago and at comparatively low prices, the result is that to avail themselves of the reduction from the present basis of prices, the buyers will be obliged to give up this favorable tonnage. According to the construction placed on the matter by the mills, the concession which applies to contracts made July 15 or later, covers the requirements of the present manufacturing season, or from July 31, 1918 to June 1, 1919, and does not cover tonnage placed originally for other seasons. The $5 cut does not apply to plates, structural shapes or hoops. Also in the case of wagon manufacturers, it is limited to only farm vehicles; such wagons as are being built for the government are not included. The special concession now is being put into effect on shipments to the implement manufacturing trade in this district. A rebate is being made on all charges in excess of that now stipulated on tonnage shipped after July 15.

More Affidavits Needed

Chicago, Oct. 1.—A recent ruling of the war industries board has extended the necessity for affidavits of essential need to shipments made on old contracts, some dating back many months. This has caused mills to notify all holders of contracts to get these documents in at once as shipments may be held up in their absence. The recent purchase of the plants of the Moline Plow Co. by the Willys-Overland Co. is expected to inject a new influence into the manufacture of agricultural implements. Application of automobile quantity production methods in this industry are expected to work some changes and concentration on a selected line will give another impetus to production. This move is regarded as an important feature of this market.

Bar iron users are still buying steadily and at a rate that is gratifying to mills, tonnage for the remainder of the year now being regarded as assured. Tonnages for railroads from mills operated in connection with railroad scrap yards is not sufficient and some bar iron is being taken by railroads in addition. Hard bars rerolled from rails continue scarce as rails are difficult to obtain. Most old rails are sold to mills on the line of the road having them for sale and permits are said to be necessary to ship them further.

Bolt Makers Busy

Chicago, Oct. 1.—Bolt and nut makers continue to refuse business on most inquiries, order books being loaded heavily. Heavy inquiry is being met without makers being able to accommodate prospective buyers. Lack of material is appearing as a deterrent in some cases but output has not been materially affected by this fact.

Makers Heavily Committed

Pittsburgh, Oct. 1.—Heavy demands continue to be made upon the makers of nuts, bolts and rivets and as the supply of steel allotted them is very much restricted due to diversion to other industries, few if any of them are able to keep anywhere nearly abreast of their orders. On bolts makers are sold as much as two months ahead. Practically 100 per cent of the output of all three products is going on high priority rating. New government demands are constantly being made upon the manufacturers.

Mills Well Sold Up

Pittsburgh, Oct. 1.—Production of cold rolled shafting is running far behind the demand and the mills at the present rate of operations, which is not better than 50 per cent owing to the scarcity of steel, are booked two to three months ahead. Demand is strongest for the larger sizes, but small stock is being used extensively in the manufacture of one-pound high explosive shells. Current shipments are practically 100 per cent against high priorities, production being too limited to permit of much attention being given the lower ratings.

Prohibition Wave Felt

Pittsburgh, Oct. 1.—Advance of the "dry" wave finds reflection in a lessened demand from cooperage interests engaged in making whisky barrels, but the loss to some extent is made good by a greater production of barrels for oil. Production of hoops and also bands feels the restrictive influence of limited shipments of steel to hot rolling strip steel mills.

Pig Iron Needs

May Cause Alloy Stocks To Be Charged Over—Market Quiet

New York, Sept. 28.—Not much new business has been brought out by the notifications recently sent to consumers by importers of British ferromanganese that practically no more import licenses for this material would be available. Most of the important consumers have contracted for sufficient domestic metal to meet the larger portion of their requirements for sometime ahead. The cutting off of English imports is due to British needs of pig iron. It is planned to produce only enough ferromanganese and spiegeleisen in Great Britain to take care of British requirements.

The project to switch over to pig iron, a number of furnaces now making ferromanganese and spiegeleisen in this country, apparently has reached an active stage. Some furnaces making ferromanganese and spiegeleisen it is felt, are much better situated than others to manufacture pig iron.

A scarcity has developed in prompt ferromanganese. Numerous consumers are in the market for spot material. Some inquiry for last quarter and first quarter is out.

In some cases of late the $3.50 unit price appears to have been shaded on units above or below 70 per cent. Most of the metal now being offered is very close to this percentage, so that the concession would mean only an immaterial reduction in the price per ton. It is reported that the $250 delivered price has been shaded in one instance.

Numerous sales of 50 per cent ferrosilicon are being transacted, and prices show considerable variation. Spot carloads in numerous cases are bringing $160, delivered, and in others, higher. Lots of 100 and 200 tons are going at $152.50 delivered. Some business has been closed at the latter price during the past few days for last quarter and first quarter, and quantities of 100 tons or more could be bought at this price for nearby. Most of the current demands are for prompt shipment. Spot 50 per cent ferrosilicon is somewhat scarcer.

In spiegeleisen, several new inquiries call for 4000 to 5000 tons. The largest of these is for slightly more than 2000 tons for the last quarter of this year and the first quarter of

next. Prices continue unchanged at $75 furnace for 16 per cent.

Figuring Their Needs

Pittsburgh, Oct. 1.—Inquiries for ferromanganese are few and far between, but early termination of this condition is expected, as consumers are understood to be figuring out their needs for the first half of 1919 and in view of the suggestion of the American Iron and Steel institute that users contract for their supplies, an early expansion in orders is looked for. It is still impossible to uncover any evidence of sales of 70 per cent ferromanganese under $250. Sales of 16 per cent spiegeleisen continue fairly frequent, but entirely in small lots. Several good sized inquiries are on the market for 50 per cent ferrosilicon for first half of 1919 delivery, but a difference of opinion with regard to prices holds up the buiness. Sale of 800 tons to a Cleveland consumer is noted at under $148 for first quarter delivery. Makers generally are not inclined to do business on this basis.

Considerable activity has developed lately in 12 per cent bessemer ferrosilicon and silveries and it may be said safely that the larger consumers are now covered on these alloys for the first half of 1919. The business is understood to have been booked at the government prices. This was not the case with the sales of some 15 per cent ferrosilicon recently made.

Ore Shipments

Will Show Big Drop For September—To Increase Reserves

Cleveland, Sept. 30.—Ore shipments from the Lake Superior district for the month ending tonight are expected to reach a total of about 8,750,000 tons. This total is 1,000,600 tons under the August shipments and 775,000 tons less than the total moved in September of last year. The grain and coal trades are making increasing calls on lake vessel tonnage with a consequent reduction in the ore shipments.

Efforts are being made to allot ore to furnaces most in need. Up to the present time, ore has been reaching practically all the furnaces in as heavy tonnages as could be handled. In some cases, delays have resulted from inability of the furnaces to unload cars rapidly. Certain furnaces, however, have sufficient reserves for the winter while others are short. These latter furnaces are to receive the bulk of the ore during the remainder of the season.

Ship Tonnages Held Back

Requirements for New Contracts Not Yet Covered—French Car Allotments Made—Mill Production on High Gear

Chicago, Oct. 1.—Although additional contracts for steel ships are being let to Pacific coast builders steel for their construction is not being allocated. No important ship tonnages have been placed with western mills recently. Some large lots of plates are known to be ready for distribution but they have not appeared yet. Production of plates is being kept at the maximum capacity of mills, regardless of the supply of steel to other finishing mills. The Northwestern Steel Co. has been given a contract for ten 8800-ton steel ships. First allocations of material for military cars for France are being made, to be used in constructing the second lot recently bought, involving 20,000 cars. One lot of 7500 tons has been placed with a western mill.

Production is Full

Pittsburgh, Oct. 1.—Plates being one of the three prime war products a comparatively full supply of ingots is reaching the mills engaged in rolling them and production is heavy. Most of the needs of car and shipbuilders are getting full attention and there is reason to suppose that these consumers have no reason for complaint about their supplies. Carbuilders have not yet received any definite instructions to give French orders preference over those intended for the national railroads. It is understood, however, that officials of the military railways under the railroad administration are threshing this matter out and that the orders intended for General Pershing later will be given priority over those for the American railways.

Japan Gets More Steel

Philadelphia, Oct. 1.—Another allotment of 122,000 tons of plates for shipbuilding in Japan recently was made to the various mills at the present government price. Some large additional allocations of ship steel for domestic yards were made during the past week as was also considerable tonnage for chlorine tanks for ammunition plants, etc. Another lot of 100,000 freight cars and additional locomotives is in sight and much plate tonnage is involved.

Government Needs Grow

New York, Oct. 1.—Platemakers at a meeting at Washington last week were advised by the government that its present needs of this product total 140,000 tons weekly. The present average output of the mills is 20,000 to 25,000 tons below this figure. As a result of the meeting every effort is being made to stimulate production at all plants. Some of these increased demands of the government are ascribed to the urgent call from General Pershing for quickened deliveries on various supplies for his armies, the need for which has been brought abruptly to a head by the developments of the present offensive.

Spike Orders

For Pershing's Railroads Are Distributed—Rail Output Pushed

Pittsburgh, Oct. 1.—Allocations of more than 20,000 kegs of standard spikes for use on Pershing and French railroads have been distributed in the past fortnight and makers are busy turning them out as quick delivery is demanded. Much of this business came to Pittsburgh district manufacturers. Fair sized orders also are coming for roads under the direction of the railroad administration. Makers of small spikes are still being urgently pressed for supplies and find it possible to meet a part of the demand. On the small sizes the mills are booked two to three months ahead. Coal mining operations account for this demand for small spikes and activity in light rails is due to the same cause. Heavy rail capacity is being taxed in getting out supplies for shipment abroad and it is expected that there will be further allocations both from this source and for the American national railroads.

Light Rail Demand Heavy

Chicago, Oct. 1.—Demand for light rails is greater than mills can accommodate and much care is being used in taking only the most essential. Capacity is about equal to the needs of domestic industrial concerns, principally coal mines, and the tonnage being rolled for military purposes in France must be rolled at the expense of some of this demand. Delivery is steady but from three to six months distant. Allocation of material for military cars has been started, as applied to the second lot, 20,000 cars.

Steel Broker Eliminated

Director Replogle Orders Semifinished Sales be Confined to Direct Transactions—Discard Offerings Growing Less

Pittsburgh, Oct. 1.—Steel manufacturers in this district have been instructed by Steel Director Replogle that no more sales of semi-finished material shall be made except directly to consumers. This order applies to shell steel discards as well as to new steel. The practical effect of these instructions is to eliminate the brokers from the semi-finished field in which they had occupied a prominent position prior to the war. The actual market influence of this new condition however will not be great since under the prevailing situation of a tight steel supply, little material has been coming out for sale either through the mills or middlemen. There also is a reducing amount of trading being done in shell discards.

Buyers now are finding it increasingly difficult to secure supplies. To all intents and purposes billets are a non-commercial commodity, for so large a percentage of the ingots find their way to rail, plate and shell steel mills that production is curtailed. Shell discards, which for a time were fairly plenty no longer come on the market in quantity, going to other departments of the same company for use in making the less essential products. Sheet bars also are scarce, because of the diversion of ingots to the more vitally essential war needs. Diversion of steel to the ultraessential war products has resulted in a supply of wire rods barely sufficient to meet the government requirements of military barbed wire and bolts and rivets for government purposes and free supplies are limited to a point of being almost nonexistent as a commercial commodity. Any change from this condition in the near future is extremely unlikely, as big allocations of barbed wire are up for distribution and the mills are committed for any surplus beyond that required for this purpose.

Discards Sell High

Philadelphia, Oct. 1.—Small tonnage of shell discard billets has been sold in this district at $47.50, Pittsburgh. The price paid in this transaction is a reflection of the scarcity in semifinished steel. Shell discard billets now also appear to be getting scarce.

Shipping On High Priorities

Pittsburgh, Oct. 1.—Current output of cold rolled strip steel is going almost entirely to direct or indirect government work, carrying high priority ratings. With the elimination of so much manufacture into which this product enters, allotments of steel have been reduced to a point where not more than 50 per cent of mill capacity is in operation.

To Allocate Wire

New York, Oct. 1.—Allocations of 100,000 tons or more of barbed wire including painted, black and galvanized product, is expected to be made almost any day by the subcommittee on wire products. This tonnage is for shipment abroad.

Higher Price

In Cast Iron Pipe Absorbed Largely By Iron Raise

New York, Sept. 30.—While the advance of $5 a ton on the base price of cast iron pipe will go into effect tomorrow, New Jersey manufacturers and others located at far eastern points, will find their position little improved. Under the new arrangement by which they will buy their iron on a Pittsburgh basis, they will be subject to a considerable increase in freight rate. This rate will approximate roughly about $3.50 a ton, leaving the manufacturer $1.50 to meet the rapidly increasing costs. The plants, located in the immediate vicinity of Pittsburgh will benefit materially. Buying continues chiefly for government account, and under existing labor conditions, which appear worse than they did even a few weeks ago, the plants are booked to capacity. Bids are expected to be asked shortly on cast iron pipe for a large cantonment to be erected on Long island. Municipal inquiry remains at a standstill.

Price Advance in Effect

Chicago, Oct. 1.—Advance of $5 per ton on cast iron pipe is in effect today but probably will have no noticeable influence on the trend of business. With the essential nature of the improvement a necessary prelude to obtaining delivery of pipe tonnages are small and few. Among prospective sources of business are two air nitrate plants for the government, at Toledo and Ancor, O. The former, which is understood to be in the hands of Bates & Rogers, contractors, will require about 600 tons of pipe. Cities are not taking much, occasional small tonnages being in evidence from time to time as the need for extensions for industrial purposes is shown.

Government Takes Tonnage

Birmingham, Ala., Oct. 1.—Considerable cast iron pipe is being manufactured in the Birmingham district but 80 per cent of it still is going for government use. All the pipe plants are equipped for other work and are carrying on these lines of production in connection with the casting of pipe. There is no cutting down of the working forces in these industries. Foundries and machine shops in general in the Birmingham districts are working at full capacity, some of them night and day.

Low Stage

Reached By Sheet Operations—Some Mills at 30 Per Cent

Pittsburgh, Oct. 1.—Operations of sheet mills have fallen sharply during the past week or so due to a further curtailment of their supplies of sheet bars. Maximum operations are not over 40 per cent and some are down below 30 per cent. Indeed so limited is the supply of sheet bars for the mills that most of them are unable to meet the requirements which carry high priority ratings. Under the circumstances much of this business is accumulating and jobbers' needs get no attention.

Supplies Are Ample

Pittsburgh, Oct. 1.—Makers of cotton ties fell behind in their deliveries, but the fact that requirements were below estimates, in keeping with the fact that the crop was smaller than expected, together with the running of the mills later than usual, has permitted them to catch up. Actually, there will be a considerable tonnage carried over into the last quarter and with little business booked for this period, supplies promise to be ample. The October price for cotton ties is $1.96 per bundle of 45 pounds.

Chairman E. H. Gary has announced the Steel corporation has decided to subscribe for $40,000,000 worth of Liberty bonds of the fourth issue. Of this amount, $20,000,000 will be paid over to the government in New York, while the remaining $20,000,000 is to be distributed in other cities.

French Experts

To Discuss Semisteel Shells at Foundrymen's Convention

"How Semisteel Shells are Manufactured in France" will be the subject of an address to be delivered by Colonel Martinon, head of the French technical mission of ordnance experts, now touring this country, at the annual meeting of the American Foundrymen's association, to be held in Milwaukee during the week of Oct. 7. American foundrymen during the next 12 months are going to be called upon by the government to produce more than 30,000,000 semisteel projectiles and since the process of manufacture is practically unknown in this country, the address to be delivered by Colonel Martinon will be both valuable and timely. For several years semisteel shells have been cast in French foundries, but the production today is inadequate to meet the constantly growing requirements of the armies on the western front. The French process has been developed to a high state of perfection and in his address, Colonel Martinon will describe all details of manufacture, including methods of molding, core making, melting, testing, etc. Also, he will be accompanied by a large number of ordnance engineers, technical experts and shop foremen, who constitute this mission.

The visit of this mission is the result of an agreement with the French minister of munitions and the chief ordnance officer of the American expeditionary forces, to have such missions from each country visit the other to secure the closest co-operation between the two countries in regard to their industrial facilities. In this manner it is possible to standardize certain details of manufacture to promote the development of new resources and otherwise to secure for each country the benefit of the technical improvements made by its ally.

Colonel Martinon, head of this mission, for several years was in charge of manufacture at the well known munitions plant of Schneider et Cie., Le Creusot, manufacturer of the 155-millimeter howitzer. Other members, including ordnance officers, technical experts, shop foreman, foundrymen, etc., include Capt. H. Guillemin, Lieutenants H. Dutilh and P. Berthier and M. Combier, engineers from Le Societe de Saint Chamond; Second Lieutenants Blanchart of the Puteaux arsenal and M. Coqua, shop superintendent of the Puteaux arsenal. The following foremen also are in the party: F. Feral, A. Cheutin, E. Ceuillerier, J. Derueux, M. Dussart, J. C. Chopin, O. Montbrun, J. Artiaque, P. Foucault, J. Pujoo, V. Clarisse, H. Barreau, J. Basset, P. Brichant, F. Deanars, R. Heuzard, A. Lefranc and C. Michaud. M. Naundorf acts as interpreter for the members of the mission.

The following committee appointed by Maj. Gen. C. C. Williams, is cooperating with the members of this mission and has arranged for the most effective utilization of its time while in this country:

Lieut. Col. James L. Walsh, president; Lieut. Col. Albert W. Erdman; Major A. B. Hubbard; Major C. J. Browne; Capt. P. E. Landolt and Capt. George Knowlton, secretary.

Harbison Not Purchaser

Pittsburgh, Oct. 1.—Hamilton Stewart, who was the successful bidder for the 3000 shares of the H. Koppers Co. representing a fifth interest in that company, which because it was in the name of Heinrich Koppers a German, was seized and sold by the alien property custodian, has not yet made public for whom he was acting in the purchase. The report that the purchase was made for the Harbison-Walker Refractories Co. is without foundation, and it also is stated that the Refractories company has no direct or indirect connection with the Koppers company

Banning in Custody

Charles F. Banning, chairman of the board of directors of the firm of Banning, Cooper & Co., pig iron and steel brokers and vice president of the Huessener Engineering Co., has been taken into custody by the federal authorities on the charge of violating the espionage act. Banning is a naturalized American, having been born in Germany. He was charged with pro-German utterances and to have secured and sent to Germany information secured from engineers connected with the war plants of the Pittsburgh district, whom he met apparently in a social way. Kurt Huessener, president of the engineering company bearing his name, and partner of Banning, is in the Allegheny county jail, held on the charge of being a dangerous alien.

The Federal Rubber Co., Milwaukee, with factories in Cudahy, a suburb, has taken a large contract for gas masks, rubber caps for hand grenades, and similar army supplies. A production of 1000 masks a day has been reached within a fortnight after the contract was accepted.

Ford Plant

At Hamilton, First of Chain to Utilize Water Power

Detroit, Mich., Oct. 1.—Henry Ford's $2,000,000 tractor plant on the banks of the Miami river at Hamilton, O., will be the first of a chain of such factories throughout the country, all of which will utilize water power, according to announcement made here. The motor manufacturer's plan is to make use of the water power resources of the country in his development of the tractor, which at the same time it is hoped will aid in the industrial development of small communities. The Hamilton plant will develop from 4000 to 5000 horsepower. Ford's Detroit motor car plant is preparing to turn out small two-man "tanks." Production will be rushed ahead of all the other war materials.

The General Motors Corp. has now devoted 75 per cent of its energies and resources to the production of war supplies, army trucks predominating. Oldsmobile, a subsidiary, plans a production of 7500 ¾-ton trucks in 1918, while the other passenger car units of the corporation, Buick and Chevrolet, are already producing trucks in large numbers.

The Michigan Central railroad will spend $2,500,000 in building a classification terminal at Niles, Mich.

The Studebaker Corp.'s Detroit plant No. 1 has completed the first of a large number of gun carriages for the government.

The Charles B. Bohn Foundry Co., will erect a 1-story core room and a 2-story addition to its plant.

Will Revise Freights

Philadelphia, Oct. 1.—In order to put Pittsburgh freight rates in the east on the proper basis in relation to the other rates, various changes are going into effect Nov. 1. On pig iron the new rate on Pittsburgh to Philadelphia, Lancaster, Camden, Burlington, $3.75; to New York, Trenton, Elizabeth and Roebling, $4.30; to Baltimore, $3.70; to Harrisburg, $3.60, and to Williamsport, $3.60. Newark will remain unchanged. Billets from Pittsburgh will be $4.60, to New York, $4 and to Philadelphia. Bars, shapes, and billets will be 47c per 100 pounds to New York and 24.50c to Philadelphia. Due to an error the rates for Philadelphia as filed, were not high enough and later increases will make billets to that city from Pittsburgh $4.10 and plate, shapes and bars, 25c per 100 pounds.

Crowder Asks Aid of Employers

Declares it as Much Their Duty to Seek Exemption for Indispensable Employes as it is to Release Those Whose Services They Can Do Without —"Judge from Standpoint of Nation's Interests"

WASHINGTON, Oct. 1.—In a circular letter addressed to employers and other representatives of industry, Provost Marshal General E. H. Crowder emphasizes their responsibility in assisting draft boards to determine the proper classification of employes. General Crowder declares it is the patriotic duty of every employer to consider the nature of his business and the interests of the nation as a whole and then to make it clear to the draft board that an employe is or is not indispensable to his business.

He points out that some registrants will not make claims for deferment on occupational grounds and that it is for the employer to decide this question and see to it that proper representation is made to the board. Even when a registrant in making out his questionnaire claims exemption on industrial grounds, General Crowder says this is insufficient and that "some one must indicate that the individual case is one that should arrest special attention of the board in respect to the registrant's occupational status."

In 1917 out of more than 3,000,000 registrants called only 4.7 per cent filed occupational claims. General Crowder's letter puts employers on their honor to say when they may release an employe for the army and makes it their duty to say when an employe is essential. His letter in part follows:

How many employers, having charge of some industrial or other occupational group, have hitherto taken pains to inform themselves systematically which of their employes are registrants and which are not? How many have studied carefully the required conditions for occupational deferment, as laid down in the President's regulations pursuant to the statute? How many have made it a point to survey their entire plant so as to single out the really indispensable individuals? With the more extensive registration, an even larger outlook is necessary. The general industrial conditions, the supply of skilled men in the industry at large, the possibilities of training substitutes, the availability of women workers—these are some of the considerations which bear directly on the need of occupational deferment as related to the need of the army.

Moreover, it is often forgotten that the selective draft is only one element in the depletion of a particular industry's man power. A second and a large element is found in the voluntary withdrawals for enlistment; how large this is may be seen from the circumstance that the total inductions by draft have reached some 2,000,000, while the total enlistments in the army and the navy amount to some 1,400,000, nearly three-quarters as many. A third element, very large, but unknown as to its precise extent, has been the transfer of labor power from one industry to another, that is, into the distinctively war industries offering the inducement of higher wages.

Industry's First Duty

THE first duty of the American industrial establishment is to bring about the needed increment of manpower in the army. The second duty is to protect the industrial establishments which are essential to supplying the soldiers with the tools of war. The war industries board directs the attention of industrial America to the fact that it has a highly important part in making the operation of the draft law successful. The first thing to do is for each employer of labor to thoroughly familiarize himself with the details of the law. The next is to make it a matter of honor to ask for industrial exemption for the lowest possible number and only for the indispensable key men. By observing these two points the duty to the army and the duty to the army's supply source will be discharged.—B. M. Baruch, chairman, war industries board.

How relatively small, in actual effect, has been the effect of the selective draft is seen in the fact that for all the occupations represented in the 8,700,000 classified registrants of January, 1918, the percentage of the entire industrial population represented by the class I registrants amounted to only 6 per cent. It ran as low as 3 per cent for some occupations, and correspondingly higher for some other occupations; but the national average was only 6 per cent. Any noticeably larger depletions in particular industries must, therefore, have been due partly to enlistments and in probably greater degree to voluntary transfers into other industries.

These other influences are, therefore, to be kept in mind by employers and others in weighing the question whether the best solution in the national interest is to ask for the deferment of individuals or groups of men. Such deferments may assist the immediate situation in the particular establishment; but they merely force the army and navy to seek elsewhere for the same number of men thus deferred. The quantitative needs of the military forces are known and are imperative; and any given quantity of deferments will ultimately have to be made up by the depletion of some other occupation. Thus, it becomes the employer's duty to consider these largest aspects of deferment in seeking that solution of his own problems which best comports with the national interests.

My present object is to urge upon employers the duty and responsibility of becoming well advised in all these matters; of equipping themselves with full information as to the extent to which their particular establishment is affected by the liability of registrants to military service; of observing the extent to which other influences of depletion have affected it, and the degree in which other methods of supply can relieve that depletion; and of laying these facts, and other pertinent ones, before the industrial advisers now to be placed at each district board to the end that those individuals or groups who are indispensable and irreplaceable would receive deferment whether or not they have made claim for it, and that the army and the navy should not be deprived of its proper supply of manpower by ill-considered deferments not absolutely demanded by the national interest.

The cessation of enlistments will henceforth protect industry against one irregular and uncontrollable source of derangement. It will correspondingly throw upon the selective service system the greater responsibility for an intelligent and discriminating selection made in the light of industrial needs. But this responsibility is shared by employers and all who represent groups of workers. To fulfill this responsibility they must now prepare themselves even more carefully than hitherto. They will find the boards heartily ready to co-operate with them to the utmost.

The keynote of purpose for all of us ought to be, and I am sure will be, that wise and profoundly significant phrase in the act of congress under which we operate, "the maintenance of the military establishment or the effective operation of the military forces, or the maintenance of national interest during the emergency."

Pledge Every Ton of Iron to War

Consumers Being Called Upon to Devote Supplies Only to Essential Requirements—Furnaces Requested to Make Canvass—Movement Supplements Efforts to Increase Production Now Being Fathered by Government

IN order to further insure that every ton of pig iron shall be applied to urgent requirements under present conditions, consumers are being called upon to give individual pledges that they will devote iron in their possession only to the serving of essential needs. This pledge is similar to that given individually by the steel producers some weeks ago and extended by the latter to their business associates and employes. A letter to the pig iron producers asking them to obtain the pledges from their customers has been sent out by the subcommittee on pig iron, iron ore and lake transportation of the American Iron and Steel institute.

The strict application of pig iron to essential needs called for by the committee, grows out of the present shortage of supply and of the necessity of making every ton count for the most. This effort is in harmony with the unified plan recently undertaken by all government departments interested to speed up production to the maximum point. It is pointed out that a "ton of pig iron saved is a ton produced."

The committee's letter follows:

To Producers.

Gentlemen:—At the meeting of the pig iron producers, held in New York, Sept. 11, it was the unanimous opinion of those present that similar action should be taken by the pig iron producers as is being taken by producers of other lines in the iron and steel industry, in obtaining pledges from customers that pig iron will only be used by them for direct and indirect governmental essential needs—this being in line with the recent announcement by the war industries board, from which we quote the following:

The manufacturer will, upon receipt of such order, scrutinize it carefully in the light of the other demands made upon him, and in the light of the relation of the demands to the supply generally, and the particular requirements and demands for the products ordered, to guard against hoarding or inequitable distribution of the supply available to meet all demands for essential uses. The government is depending upon the experience and patriotism of the manufacturers to assist it in securing an equitable distribution of all products, and their restrictions to essential uses.

Every possible use of iron and steel or their products which can be deferred, must be deferred until after the war. This duty is PERSONAL and cannot be avoided or delegated to your friends and neighbors. No consumption is so small as to be immaterial, and no saving insignificant.

An Exclusive Story

TODAY, business men must have promptly accurate information regarding the tremendous changes occurring at frequent intervals in the country's commercial life, including new legislation and rapidly shifting problems of finance, business and labor.

That THE IRON TRADE REVIEW *has fortified itself to give this imperatively needed service is evidenced by an article in last week's issue devoted to the new 8-hour day plan of the United States Steel Corp. Unquestionably one of the greatest developments in the labor history of the steel industry, this plan affects every independent steel producer and, consequently, every consumer of iron and steel products in this country and abroad.*

Among weekly iron and steel business papers, THE IRON TRADE REVIEW *alone published the news of this epochal change—a testimonial of the broadening service with which it is endeavoring to meet the wartime needs of business men for complete and prompt information.*

Every pound collected and sold to scrap iron dealers finds its way back into the general supply of iron and steel. "The last quarter hour will win the war," and in that quarter hour, the last shell will be fired. That shell may be made from steel that has been saved through the collection of scrap, or through denial of the luxury of purchasing steel in the form of articles which have come to be regarded as peace-time necessities.

It is imperative that every manufacturer, jobber and retailer of iron and steel products should fully realize and make his salesmen and customers realize that his attitude toward his trade is exactly the reverse of that in normal times. It requires no salesmanship merely to sell goods where the demand greatly exceeds the supply, but it does require real salesmanship, and a high degree of patriotism to sell with discrimination, with a view of limiting the purchases to strictly essential uses, the controlling consideration being: Where can these stocks be best placed in the public interest?

While the several divisions of the war industries board are anxious to assist you, and will not hesitate as occasion may require to direct you, this nevertheless is YOUR problem. With confidence we look to you for such policing of the distribution of iron and steel products as will insure each pound being applied ONLY to essential uses.

The pledge suggested by the war industries board is as follows:

We do hereby pledge ourselves not to use, or as far as lies within our power, permit the use of any stocks now in or which may hereafter come into our possession or control, save (1) for essential uses, as that term may be defined from time to time by the priorities division of the war industries board, or (2) under permits in writing signed by the director of steel supply; that we will make no sale or delivery from such stocks to any customer or retailer before his filing with us a similar pledge in writing; and that we will use our utmost endeavor to prevent the hoarding of stocks, and to insure that they may be distributed solely for essential uses.

At the pig iron producers' meeting it was left to the undersigned to communicate with each producer of pig iron, and request him to obtain from each of his customers (if he has not already done so) a pledge of this kind, and on any new order or allocation with concerns who have not made a pledge to him, to obtain same at the time of entering the order. Pledges so obtained to be kept by the producer. Please notify the undersigned of any consumer refusing to give a pledge.

You doubtless were represented at the meeting in Mr. Replogle's office in Washington, on Monday, the 23rd inst., at which time the urgent necessity for increased production of pig iron was made plain. We must have a larger production of pig iron if we are to fulfill the governmental needs. To paraphrase an old saying: "A ton of pig iron saved is a ton produced." We, therefore, urge your earnest attention to this matter, and a prompt compliance with this request.

As stated by the war industries board, THIS DUTY IS PERSONAL TO YOU, AND CANNOT BE AVOIDED OR DELEGATED TO YOUR FRIENDS OR NEIGHBORS.

Yours very truly,

H. G. DALTON, Chairman.

Full Concession

To Implement Trade As Agreed By Institute Is Announced

New York, Oct. 1.—Concessions on various steel products to the agricultural implement manufacturers which have been agreed to by the American Iron and Steel institute now are announced fully. On steel bars the reduction is $5 per ton; 8 points on rolled shafting; $5 per ton on bands, $5 per ton on harrow discs and 6.40c on 15 x 5/32-inch colters, making special prices of 2.65c, Pittsburgh, on bars; 25 off on shafting; 3.25c on bands; 7.50c on harrow discs; and 89 cents each on colters. These prices apply to all shipments on and after July 15, 1918, and only on contracts made for delivery in the period from July 31, 1918, to June 30, 1919. They apply only to agricultural implements and farm equipment made by the agricultural tool makers such as lawn mowers. The special prices do not apply to undelivered balances on old contracts.

Explains 8-Hour Day

New York, Oct. 1.—Concerning the recent action of the Steel corporation in adopting the basic 8 hour day, Judge Gary states it is the intention of the corporation to pay the existing rates for 8 hours and time and a half above that for all additional hours including Sundays and holidays. Judge Gary states that the corporation's action was influenced partly by that taken by other companies.

Makes Price Revision

Several errors in the full schedule of warehouse prices put out under date of September 24 are announced by the American Iron and Steel institute. This schedule as originally issued by the institute was published in the Sept. 26 issue of THE IRON TRADE REVIEW, page 708. Barbed wire (galvanized) was given in that table at all cities $1 below the intended level. The revised figure should be $5.595, New York, instead of $4.595 with corresponding charges in the case of other cities. A similar error was made in the case of cut nails. The New York price for that product should be $5.745 instead of $4.745 with corresponding charges in the case of other cities. In Merchant Boiler Tubes Charcoal-Iron, a plus sign should be applied before all the various sizes for all cities. In the list of Merchant Boiler Tubes Lapweld-Steel, the plus sign was omitted before the 2¼-inch and the 2½-inch to 3¼-inch items in the San Francisco list. The correct differentials for these sizes are plus 8 and plus 10 per cent, respectively.

Because of new method of basing cold rolled steel at Pittsburgh instead of at mill cold rolled strip prices have been changed to the following: New York, $7.995; Chicago and Boston $8.02; Philadelphia, Cincinnati and Detroit to $7.98; Cleveland and Buffalo to $7.92; St. Louis to $8.09, and San Francisco to $9.00.

To Save Tin Plate

Washington, Oct. 1.—The war department has undertaken a conservation step in the matter of filling tomato cans which will result in an estimated saving of approximately 32,000 base boxes of tin plate annually. The quartermaster inspection bureau has found that, fully meeting weight requirements, No. 3 tomato cans purchased by the army are filled to within three-eighths of an inch of the top. Instructions have been issued to fill the cans, regardless of weight. This conservation, the quartermaster corps announces, means the equivalent of 417,000 cases of tomatoes, costings $1,500,000, and 7,000,000 square feet of tin plate.

The Pittsburgh office of Shimer & Co., will hereafter handle babbitt metal and solder for a western smelting interest.

The Non-Ferrous Metals

Copper Lead Spelter Tin

	*Copper	†Spot Straits, tin	‡Lead, New York basis	Spelter St. Louis basis	§Aluminum	Spot antimony
Sept. 24	26.00	.....	8.05	9.20	33.00	14.00
Sept. 25	26.00	.....	8.05	9.20	33.00	14.00
Sept. 26	26.00	.....	8.05	9.15	33.00	13.87½
Sept. 27	26.00	.....	8.05	9.10	33.00	13.87½
Sept. 30	26.00	.....	8.05	9.05	33.00	13.87½

*Government fixed maximum price for prime lake, electrolytic and casting copper, in ingots, pigs, slabs, etc., less than carloads, 27.30c.

†No spot Straits tin offering.

‡Price agreed to by leading interest and independents.

§Government fixed price for 98 to 99 per cent ingot aluminum in 50-ton lots; lots 15 to 50 tons, 33.10c; one to 15 tons, 33.20c.

NEW YORK, Sept. 30.—Little further light has been thrown on the tin situation the past week. The war industries board has announced the formation of an "interallied executive" which shall control the distribution of the world's output of tin, stating that American consumers were to receive two-thirds, or about 80,000 tons annually. In line with this plan, no quotations have been cabled from Singapore on Straits tin since Sept. 13. However, quotations on other grades of tin continue to be received from other primary markets, Banca for October shipment from Batavia being cabled as 89c, c.i.f. New York; Australian, for November shipment from Australia, 77.25c, c.i.f. New York; Chinese No. 1, for prompt shipment from Hongkong, nominally, $1 a pound. These prices, of course would seem to indicate that the interallied control has not yet extended to any tin excepting Straits. There is much question in the tin trade as to whether such control could be extended to Banca tin, this grade being produced in a neutral colony, excepting by concentration of all buying power in a central body. In such event, the question is asked, would such policy eliminate the importers who heretofore have been active in supplying the world's consumers? In case of such elimination, how would the old contracts of consumers, covering them for the next several months, be executed? These are questions which, of course, the interallied executive has considered, but the tin trade is wondering what the solution will be.

The spelter market has been gradually softening, in the absence of active buying, during the past week. Metal for prompt shipment has gradually settled close to a 9c East St. Louis basis. For forward shipment, lower prices prevail, October being quoted about 8.90c and November-December, about 8.80c.

The lead situation shows little change, distribution being centralized in the hands of the lead producers' committee, which is acting as a clearing house for all orders and which scrutinizes each order carefully, eliminating such as do not apply to essential war purposes. It is estimated that more than 90 per cent of the lead being produced is going into direct and indirect war work. Prices are unchanged at 8.05c, New York, and 7.75c, St. Louis basis.

A large amount of Japanese antimony for October-November shipment from the Orient recently has been sold at 13.25c, c.i.f. New York, in bond and importers now are asking 13.37½c. Chinese antimony, which formerly ruled the same as Japanese, is quoted at 14c to 15c, c.i.f. New York, in Shanghai, where the market is free and open, whereas the Japanese government allows exportation only to the United States and the allies. Spot antimony is quoted 13.87½c, duty paid, New York.

The allied governments are taking much raw copper and are asking for the brass they can get. In this country, there is practically no commercial business, brass making for war purposes consuming nearly the whole output. Better conditions are prevailing at the copper refineries, owing to cooler weather.

The aluminum situation is unchanged, the producer of virgin metal supplying practically all of its output to government contractors, on the basis of the fixed price of 33c for 98 to 99 per cent ingots with extras for quantities and manufactured shapes.

All Set for Milwaukee Convention

War Problems Including the Vital Questions of Labor Will Form the Main Topics of Discussion at the Great Allied Metals Congress—Machinery and Equipment Show Will be Unsurpassed

FIFTEEN years measured against a nation's history is but a short span. But fifteen years, including four such as those just past, are amply sufficient to cover vast industrial as well as social revolutions. Fifteen years ago the foundrymen of the entire continent assembled in convention at Milwaukee. Brought together by the bond of common business interest, a few hundred met to discuss the problems of their craft In 1903 the American Foundrymen's association was a potent force. Its activities aided the production efficiency of its members, engaged in supplying the demand for thousands of articles used in domestic and industrial life. The interests and motives of the foundrymen attending the original Milwaukee meeting were individual and divergent.

During the week of Oct. 7 the American Foundrymen's association, in conjunction with other great national technical societies, again will meet in Milwaukee. Its membership has grown from hundreds to thousands, representing great advances in all the kindred processes which fit metals for the service of mankind. The meeting place is identical; the problems of common business interest are the same; but the motives and interests of everyone concerned have been molded into the one common purpose—*war service*. The coming event measured in the light of value and service cannot fail to tower above that meeting held in 1903. It has been aptly named the Allied Metals congress. Today our sole aim is to win the war. The production of those materials which will advance this purpose is the factor which will predominate in all the sessions of the convention.

In addition to the twenty-third convention of the American Foundrymen's association, the American Institute of Mining Engineers, Iron and Steel section, will hold its 118th meeting, and the Institute of Metals division of the Mining Engineering society will likewise gather in Milwaukee during the same time. The American Malleable Castings association will also meet in Milwaukee on Oct. 10. To insure a large attendance of its members at the steel session of the American Foundrymen's association, the Steel Founders' Society of America has decided to hold its regular monthly meeting for October, customarily held in New York, in Chicago on Oct. 11, after its members have had opportunity to attend the great gathering in Milwaukee.

The keynote of this Allied Metals congress will be the winning of the war. Many of the papers to be presented and addresses to be delivered have for their theme the acceleration of manufacture by improved methods, the release of man-power for military service by the installation of labor-saving equipment and the conservation of materials needed for the conduct of the war. Probably no more psychological time might have been selected for this exhibition. The recent registration will greatly deplete the already declining manpower of the country and the labor-saving equipment that will be shown will demonstrate to manufacturers how they may release some of their employes for military service and still maintain their output at present capacity. Only by the installation of labor-saving equipment can the metal working industries generally maintain their present output, and the array of equipment to be displayed will be a demonstration of how machine-power can compensate for the waning man-power of this country

One of the unusually interesting features of this exhibition will be a display of war equipment to be made under the auspices of the ordnance section of the war department. It will include a gun, machine guns of various types, shells, hand grenades, rifle grenades and other missiles of warfare. The great majority of the manufacturers who will attend this show, will have an opportunity to see for the first time the assembled product for which they are engaged in making parts.

The program of moving pictures, all of which have a bearing on some phase of industry, never before has been remotely approached. It will include military films to be shown by Maj. Frank B. Gilbreth in his address on "Modern Methods of Transferring Skill", in which the assembling of the Browning gun and the use of hand grenades will be illustrated. One afternoon will be devoted entirely to the display of moving pictures and the various topics include "The Civil Re-establishment of Crippled Soldiers

Condensed Program

Monday, Oct. 7

10:00 A. M.—Registration, Milwaukee Auditorium.

1:00 P. M.—Opening of the exhibition, Milwaukee Auditorium.

Tuesday, Oct. 8

10:00 A. M.—Joint session, American Foundrymen's Association, Institute of Metals Division and Iron and Steel Section of the American Institute of Mining Engineers, Plankinton hall, Milwaukee Auditorium.

11:30 A. M.—Opening session, American Foundrymen's Association, Plankinton hall.

11:30 A. M.—Opening session, Institute of Metals Div's'on, American Institute of Mining Engineers, Kilbourn hall.

11:30 A. M.—Opening session Iron and Steel Section, American Institute of Mining Engineers, Engelmann hall.

Afternoon—Automobile sightseeing tour for the ladies.

Evening—Reception, concert and dance, Juneau hall, Milwaukee Auditorium.

Wednesday, Oct. 9

10:00 A. M.—Professional session, American Foundrymen's Association, Plankinton hall, for the discussion of general topics.

10:00 A. M.—Safety and Accident Prevention meeting of the American Foundrymen's Association, committee room A, Milwaukee Auditorium.

10:00 A. M.—Professional session, Institute of Metals Division, American Institute of Mining Engineers, Kilbourn hall.

10:00 A. M.—Iron and Steel section, American Institute of Mining Engineers, session on Coal and Coke, Engelmann hall.

Noon—Luncheon for the ladies, Schlitz palm garden.

3:00 P. M.—Professional session, Institute of Metals Division, American Institute of Mining Engineers, Kilbourn hall.

3:00 P. M.—Moving pictures, Plankinton hall.

8:00 P. M.—Theater party, Majestic vaudeville house.

Thursday, Oct. 10

8:30 A. M.—Guests assemble at Milwaukee Auditorium for plant visitation.

10:00 A. M.—Gray Iron session, American Foundrymen's Association, Plankinton hall.

10:00 A. M.—Malleable sess'on, American Foundrymen's Association, Engelmann hall.

10:00 A. M.—Steel session, American Foundrymen's Association, committee room A.

10:00 A. M.—Professional session, Institute of Metals Div's'on, American Institute of Mining Engineers, Kilbourn hall.

1:30 P. M.—Guests assemble at Milwaukee Auditorium for plant visitation.

Afternoon—Card party and tea for the ladies in the Badger room, Wisconsin Hotel.

7:00 P. M.—Annual banquet, Milwaukee Auditorium.

Friday, Oct. 11

8:30 A. M.—Guests assemble at Milwaukee Auditorium for plant visitation.

10:00 A. M.—Final professional session of the American Foundrymen's Association for the discussion of general topics, Plankinton hall.

1:30 P. M.—Guests assemble at the Milwaukee Auditorium for plant visitation.

in Canada," "The Building of Concrete Ships," "Submarines and Torpedoes in Action." At the banquet on Thursday night, moving pictures will show the tremendous development of the Hog Island shipyard and the use of castings in the Construction of these ships. Other films include "The Triplex Process of Making Steel," "Cause and Prevention of Industrial Accidents" and "Gas and Flame Warfare."

All of the activities of this great metals congress will be centered at the Milwaukee auditorium throughout the week. In the spacious halls afforded by this exposition building the simultaneous meetings of the various organizations can be conducted without interference. The meetings of the different societies will open with a joint session on Tuesday morning at which addresses will be delivered, all having a bearing on war activities. At the close of this joint session the American Foundrymen's association, the Iron and Steel section and the Institute of Metals division of the American Institute of Mining Engineers will hold their first meetings in separate halls. On Wednesday morning the American Foundrymen's association will have simultaneous sessions, one for the discussion of general topics and the other will be devoted exclusively to the consideration of safety, sanitation and accident prevention in industrial plants. Simultaneously, the Institute of Metals division and the Iron and Steel section of the American Institute of Mining Engineers will hold separate meetings in the auditorium.

On Wednesday afternoon the Institute of Metals division will have another meeting and simultaneously a series of moving pictures will be shown in one of the large halls of the Milwaukee auditorium. On Thursday morning the gray iron, steel and malleable sections of the American Foundrymen's association will hold simultaneous meetings and the closing session of the Institute of Metals division also is scheduled for that time. The final professional session of the American Foundrymen's association will be held on Friday morning.

A large number of noteworthy papers will be read and many addresses will be delivered on topics relating to problems arising from war

Program, American Foundrymen's Association

Monday, Oct. 7

10:00 A. M.—Registration, Milwaukee Auditorium.
1:00 P. M.—Opening of exhibition, Milwaukee Auditorium.

Tuesday, Oct. 8

10:00 A. M.—Joint opening session, American Foundrymen's Association, Iron and Steel Section and Institute of Metals Division, American Institute of Mining Engineers, Plankinton hall, Milwaukee Auditorium. Benj. D. Fuller, chairman, president of the American Foundrymen's Association.

Address of welcome, by Hon. Emanuel L. Phillipp, governor of Wisconsin, Madison, Wis.

Response to the address of welcome, by Benj. D. Fuller, president of the American Foundrymen's Association.

"Activities of the Army Ordnance Department, Especially as Applied to Foundry Matters," address by C. S. Koch, Cannon Division, War Department, Washington, D. C.

"Co-operation between the Railroad Administration and the Foundry Industry," address by E. D. Brigham, manager iron ore, coal and grain traffic, United States Railroad Administration, Duluth.

"Modern Methods of Transferring Skill," illustrated by military films, address by Major Frank B. Gilbreth, Providence, R. I.

11:30 A. M.—Professional session, Plankinton hall.

Annual address by Benj. D. Fuller, president American Foundrymen's Association.

Report of the board of directors of the American Foundrymen's Association, Inc.

Report of the secretary-treasurer of the American Foundrymen's Association, Inc., by A. O. Backert, Cleveland.

Report of the A. F. A. Committee on Foundry Costs, by J. Roy Tanner, Pittsburgh Vale, Foundry & Construction Co., Pittsburgh.

Appointment of nominating committee and committee on resolutions.

Afternoon—Automobile sightseeing tour for the ladies with luncheon at the plant of the Schlitz Brewing Co., which will be served by the courtesy of this company.

Evening—Reception, concert and dance, Juneau hall, Milwaukee Auditorium. Light refreshments will be served and handsome souvenirs will be given to the ladies.

Wednesday, Oct. 9

General Topics

10:00 A. M.—Professional session, American Foundrymen's Association, Plankinton hall.

Benj. D. Fuller, chairman, president of the American Foundrymen's Association.

"Selecting the Sand Blast Equipment for the Foundry," by H. D. Gates, Pangborn Corp., Hagerstown, Md.

"Engineers—Their Relation to the Foundry in the Saving of Labor," E. S. Carman, Cleveland Osborn Mfg. Co., Cleveland.

"Women in the Foundry," by C. E. Knoeppel, C. E. Knoeppel & Co. New York.

"Cottrell Precipitation Process and its Application to Foundry Dust Problems," by H. D. Egbert, Research Corp., New York.

"The Commerce of Coke," by J. A. Galligan, Pickands, Brown & Co. Chicago.

"Sale and Distribution of Foundry Pig Iron in War Times," by C. J. Stark, editor, The Iron Trade Review, Cleveland.

"Ferruginous and Other Bonds in Molding Sands," by Prof. P. S. H. Boswell, Imperial College of Science and Technology, South Kensington, London, England.

Report of nominating committee and election of directors of the American Foundrymen's Association, Inc.

Session on Safety and Accident Prevention

10:00 A. M.—Professional session, American Foundrymen's Association, committee room A.

Victor T. Noonan, chairman, Director of Safety, Industrial Commission of Ohio, Columbus, O.

"What the State Can do to Prevent Accidents," address by Hon. Thomas J. Duffy, chairman, Industrial Commission of Ohio, Columbus, O.

"Accident Prevention is Good Business," address by Fred M. Wilcox, vice president, Industrial Commission of Wisconsin, Madison, Wis.

Report of the A. F. A. committee on Safety, Sanitation and Fire Prevention, by Victor T. Noonan, chairman, Director of Safety, Industrial Commission of Ohio, Columbus, O.

"Problems of the Returned Soldiers," by W. A. Janssen, Canadian Steel Foundries, Ltd., Montreal.

"The Personal Interest of the Employer is Necessary in Accident Prevention," by Victor T. Noonan.

"The Vital Importance of Industrial Accident Prevention in War Times," by Victor T. Noonan.

"An Accident Prevention Campaign in an Open-Hearth Steel Foundry With the Aid of Safety Committees," by F. G. Barnett, Director of Safety, Buckeye Steel Castings Co., Columbus, O.

"Cause and Prevention of Industrial Accidents," moving pictures to be shown, by Victor T. Noonan.

"Safety and Efficiency, Facts and Figures," by C. W. Price, field secretary, National Safety Council, Chicago.

12:00 M.—The ladies will be served a Dutch lunch at the Schlitz palm garden. In addition to an orchestra, several noted speakers will be on the program.

Moving Pictures

3:00 P. M.—Plankinton hall.
Moving pictures on the construction of concrete ships.
Moving pictures on the civil re-establishment of crippled soldiers.
Submarines in action.
Torpedoes in action.
8:00 P. M.—Theater party, Majestic vaudeville house.

(Concluded on Page 775)

activities. C. S. Koch, of the cannon division of the war department, will discuss the activities of the army ordnance department, especially as applying to foundry matters and E. D. Brigham, manager iron ore, coal and grain traffic of the United States railroad administration, will deliver an address on "Co-operation Between the Railroad Administration and the Foundry Industry." "Women in the Foundry" is the title of the paper to be read by C. E. Knoeppel, of C. E. Knoeppel & Co., New York, and Charles J. Stark, editor of THE IRON TRADE REVIEW, will deliver a paper entitled "Sale and Distribution of Foundry Pig Iron in War Times," in which every foundryman will be vitally interested. W. A. Janssen, manager Canadian Steel Foundries, Ltd., Montreal, will deliver an address on "The Problems of the Returned Soldier" and "Cast Iron in Service Projectiles in Trench Warfare" will be the subject of an address by Maj. Edgar Allen Custer of the Pittsburgh district ordnance department. "The Manufacture of Ordnance Steel for the Army and Navy" and "Meeting Specifications for Army Ordnance Steel Castings" are the subjects of two vitally important papers of interest today to all steel castings manufacturers. A topical discussion of ordnance steel problems will follow the presentation of these papers.

The annual banquet to be held in the Milwaukee auditorium on Thursday evening will allow the members attending an exceptional opportunity to hear speakers of international fame. Charles M. Schwab, director general of the Emergency Fleet corporation, has consented to set aside sufficient time to come to Milwaukee to deliver an address at this banquet Maj. A. Radclyffe Dugmore, who has just returned from the front, will describe war conditions from first hand knowledge. W. H. Blood, Jr., of the American International Shipbuilding Corp., Philadelphia, will deliver an illustrated address on the Hog Island shipyard.

Plant visitation will be confined to Thursday and Friday, Oct. 10 and 11. On both days guests desiring to participate in plant inspection will gather at the Milwaukee auditorium.

Program, American Foundrymen's Association

(*Concluded from Page 774*)

Thursday, Oct. 10

Gray Iron Session

10:00 A. M.—Professional session, American Foundrymen's Association, Plankinton hall.

Benj. D. Fuller, chairman, president of the American Foundrymen's Association.

"The Continuous Two-Story Foundry," by J. F. Ervin, Michigan Motor Castings Operating Co., Flint, Mich.

"Organizing a Foundry for the Economical Production of Gray Iron Castings," by Paul R. Ramp, Campbell, Wyant & Cannon, Muskegon, Mich.

"Cast Iron in Service Projectiles and Trench Warfare," address by Major Edgar Allen Custer, Pittsburgh District Ordnance Department, Pittsburgh.

"The Use of Positive Displacement Blowers in Cupola Practice," by W. Trinks, Carnegie Institute of Technology, Pittsburgh.

"Recent Developments in Burning Oil in Cupolas," by John Howe Hall, Taylor-Wharton Iron & Steel Co., High Bridge, N. J.

Report of A. F. A. Committee on General Specifications for Gray Iron Castings, by Richard Moldenke, Watchung, N. J.

"A Rapid Method for the Determination of Graphitic Carbon," by Frank H. Kingdon, Sullivan Machinery Co., Claremont, N. J.

Malleable Session

10:00 A. M.—Professional session, American Foundrymen's Association, Engelmann hall.

J. P. Pero, chairman, Missouri Malleable Iron Co., East St. Louis, Ill.

"Malleable Iron as a Material in Engineering Construction," by H. A. Schwartz, National Malleable Castings Co., Indianapolis.

"Experiments in Annealing Malleable Iron," by H. E. Diller, General Electric Co., Erie, Pa., with written discussion by P. Dressler, American-Dressler Tunnel Kilns Co., New York.

"A Modern Core Room," by Donald S. Barrows, T. H. Symington Co., Rochester, N. Y.

"Some Factors in the Manufacture of High Grade Malleable Iron Castings," by J. G. Garrard, Northwestern Malleable Iron Co., Milwaukee.

"The Integrity of the Casting," by Enrique Touceda, consulting engineer, Albany, N. Y.

Report of the A. F. A. Committee on Specifications for Malleable Iron Castings, by Enrique Touceda, Albany, N. Y.

"Advantages of Malleable Iron Versus Steel for Agricultural Castings," by P. A. Paulson, Rockford Malleable Iron Co., Rockford, Ill.

Steel Session

10:00 A. M.—Professional session, American Foundrymen's Association, committee room A.

C. R. Messinger, chairman, Sivyer Steel Casting Co., Milwaukee.

"Ordnance Steel for the Army and Navy," by John Howe Hall, Taylor-Wharton Iron & Steel Co., High Bridge, N. J.

"Meeting Specifications for Army Ordnance Steel Castings," by Capt. E. R. Swanson, ordnance department, inspection division, Washington, D. C.

Topical discussion of ordnance steel problems will follow the presentation of the two foregoing papers.

"Making Steel Castings on the Pacific Coast," by J. D. Fenstermacher, Columbia Steel Co., San Francisco.

Report of the Committee on Steel Foundry Standards, by W. A. Janssen, chairman, Canadian Steel Foundries, Ltd., Montreal.

"The Electric Furnace in the Steel Foundry," by W. E. Moore, W. E. Moore & Co., Pittsburgh.

"The Advantages of the Basic Lining for Electric Furnaces," by F. J. Ryan, Electric Furnace Construction Co., Philadelphia, Pa.

Plant Visitation

Guests desiring to follow the regular plant visitation schedule are requested to meet at the Milwaukee Auditorium at 8:30 a. m. A private car will take them to the plant of the Allis-Chalmers Mfg. Co., and to the Kearney & Trecker Co. At 1:30 p. m. a private car will take the guests to the plant of the Falk Co. and the Chicago, Milwaukee & St. Paul railroad shops.

Afternoon—Card party and tea for the ladies in the Badger room, Wisconsin hotel. Handsome prizes will be awarded.

7:00 P. M.—Annual banquet, Milwaukee Auditorium.

Friday, Oct. 11

General Topics

10:00 A. M.—Professional session, American Foundrymen's Association, Plankinton hall.

Benj. D. Fuller, chairman, president of the American Foundrymen's Association.

"Effective Means of Improving the Quality of Foundry Sand Mixtures," by Henry B Hanley, New London Ship & Engine Co., Groton, Conn.

"How Cost and Inspection Data are Secured in the Foundry of the Naval Gun Factory," by Lieut. Walter S. Doxsey, U. S. Navy Yard, Washington, D. C.

Report of the A. F. A. Committee advisory to the United States Bureau of Standards, by Richard Moldenke, Watchung, N. J.

"Pyrometers and Their Application to Core Ovens," by G. W. Keller, Brown Instrument Co., Philadelphia.

"Concrete Foundry Floors," by George Moyer, Textile Machine Works, Reading, Pa.

"A Pouring Device for Modern Foundries," by Mark P. Ohlsen, Brillion Iron Works, Brillion, Wis.

"Gas and Flame Warfare," shown in moving pictures.

Installation of officers.

Plant Visitation

A private car will leave the Milwaukee Auditorium at 8:30 a. m. for the plants of the Wisconsin Gun Co., Sivyer Steel Casting Co. and the Pawling & Harnischfeger Co. At 1:30 p. m. a private car will take the guests to the plants of the Northwestern Malleable Iron Co., Vilter Mfg. Co. and the Filer & Stowell Co.

Program, Institute of Metals Division, A. I. M. E.

Monday, Oct. 7

10:00 A. M.—Registration, Milwaukee Auditorium.

1:00 P. M.—Opening of exhibition, Milwaukee Auditorium.

Tuesday, Oct. 8

10:00 A. M.—Joint opening session, American Foundrymen's Association, Iron and Steel Section and Institute of Metals Division, American Institute of Mining Engineers, Plankinton hall, Milwaukee Auditorium. Benj. D. Fuller, chairman, president of the American Foundrymen's Association. (See American Foundrymen's program for details.)

11:30 A. M.—Professional session, Institute of Metals Division, Kilbourn hall.

"The Metallography of Tungsten," by Zay Jeffries, Aluminum Castings Co., Cleveland.

"The Constitution of the Tin Bronzes," by S. L. Hoyt, University of Minnesota, Minneapolis.

Paper, title not given, by C. H. Matthewson, Sheffield Scientific School, Yale University, New Haven, Conn.

"Notes on Babbitt and Babbitted Bearings," by Jesse L. Jones, Westinghouse Electric & Mfg. Co., East Pittsburgh, Pa.

"Oxygen and Sulphur in the Melting of Copper Cathodes," by S. Skowronski, Raritan Copper Works, Perth Amboy, N. J., with discussion by Philip L. Gill.

"The Relation of Sulphur to the Overpoling of Copper," by S. Skowronski, with discussion by Philip L. Gill, metallurgical engineer, New York.

Afternoon—Automobile sight seeing tour for the ladies with luncheon at the plant of the Schlitz Brewery Co., which will be served by the courtesy of this company.

Evening—Reception, concert and dance, Juneau hall, Milwaukee Auditorium. Light refreshments will be served and handsome souvenirs will be given to the ladies.

Wednesday, Oct. 9

10:00 A. M.—Professional session, Kilbourn hall.

Symposium on "The Conservation of Tin." This topic will be discussed by the following:

C. W. Thompson, National Lead Co., New York.

G. H. Clamer, Ajax Metal Co., Philadelphia.

C. M. Waring, Pennsylvania Railroad Co.

M. L. Lissberger, Mark Lissberger & Son, Inc., Long Island City, N. Y.

D. M. Buck, American Sheet & Tin Plate Co., Pittsburgh.

W. M. Corse, Buffalo.

G. K. Burgess and Mr. Woodward, United States Bureau of Standards, Washington, D. C.

M. L. Dizer, War Industries Board, Washington, D. C.

Jesse L. Jones, Westinghouse Electric & Mfg. Co., East Pittsburgh, Pa.

Noon—The ladies will be served a Dutch lunch at the Schlitz palm garden. In addition to an orchestra, several noted speakers will be on the program.

3:00 P. M.—Professional session, Kilbourn hall.

"The Volatility of the Constituents of Brass," by John Johnston, American Zinc, Lead & Smelting Co., St. Louis.

"Notes on the Metallography of Aluminum," by P. D. Merica, Bureau of Standards, Washington, D. C., and J. R. Freeman, Jr.

"The Effect of Impurities on the Hardness of Cast Zinc or Spelter," by G. C. Stone, New Jersey Zinc Co., New York.

"Dental Alloys," by Dr. Arthur W. Gray, L. D. Caulk Co., Milford, Del.

"Electrolytic Zinc," by C. A. Hansen, General Electric Co., Salt Lake City, Utah.

"The Condensation of Zinc from Its Vapor," by C. H. Fulton, Case School of Applied Science, Cleveland.

"The Action of Reducing Gases on Copper," by Norman B. Pilling.

8:00 P. M.—Theater party, Majestic vaudeville house.

Thursday, Oct. 10

10:00 A. M.—Professional session, Kilbourn hall.

"Notes on Non-Metallic Inclusions in Bronze and Brasses," by G. F. Comstock, Titanium Alloy Mfg. Co., Niagara Falls, N. Y.

"Nichrome Castings," by Arlington Bengal, Driver-Harris Wire Co., Harrison, N. J.

"Fusible Plug Manufacture," by G. K. Burgess and L. J. Gurevich, Bureau of Standards, Washington, D. C.

Paper, title not given, by P. D. McKinney.

"Application of the Spectroscope to the Chemical Determination of Lead in Copper," by Messrs. Hill and Lucke.

"Radium," by Richard B. Moore, United States Bureau of Mines, Golden, Colo.

Plant Visitation

Guests desiring to follow the regular plant visitation schedule are requested to meet at the Milwaukee Auditorium at 8:30 a. m. A private car will take them to the plant of the Allis-Chalmers Mfg. Co. and to the Kearney & Trecker Co. At 1:30 p. m. a private car will take the guests to the plant of the Falk Co. and the Chicago, Milwaukee & St. Paul Railroad shops.

Afternoon—Card party and tea for the ladies in the Badger room, Wisconsin Hotel. Handsome prizes will be awarded.

7:00 P. M.—Annual banquet, Milwaukee Auditorium.

Friday, Oct. 11

A private car will leave the Milwaukee Auditorium at 8:30 a. m. for the plants of the Wisconsin Gun Co., Steyer Steel Casting Co. and the Pawling & Harnischfeger Co. At 1:30 p. m. a private car will take the guests to the plants of the Northwestern Malleable Iron Co., Vilter Mfg. Co. and the Filer & Stowell Co.

Program, Iron and Steel Section, A. I. M. E.

Monday, Oct. 7

10:00 A. M.—Registration, Milwaukee Auditorium.

1:00 P. M.—Opening of exhibition, Milwaukee Auditorium.

Tuesday, Oct. 8

10:00 A. M.—Joint opening session, American Foundrymen's Association, Iron and Steel Section and Institute of Metals Division, American Institute of Mining Engineers, Plankinton hall, Milwaukee Auditorium. Benj. D. Fuller, chairman, president of the American Foundrymen's Association. (See American Foundrymen's program for details.)

Iron and Steel

11:30 A. M.—Professional session, Iron and Steel section, Engelmann hall.

"The Work of the National Research Council," by Henry M. Howe, chairman, engineering division, national research council, Washington, D. C.

"The Limonite Deposits of Mayaguez Mesa, Porto Rico," by C. R. Fettke, Carnegie Institute of Technology, Pittsburgh, and Be la Hubbard.

"The Manufacture of Ferro Alloys in the Electric Furnace," by R. M. Keeney, Ferro Alloy Co., Denver, Col.

"The Manufacture of Silica Brick," by H. LeChatelier, Paris, France, and B. Bogitch.

"Notes on Certain Iron-ore Resources of the World," New York Section Meeting of May 23, 1918.

"Recent Geologic Development on the Mesabi Iron Range, Minn.," discussion by Anson A. Betts, Anson A. Betts & Co., Ashland, N. C., and J. F. Wolff, Oliver Iron Mining Co., Duluth.

Afternoon—Automobile sight seeing tour for the ladies with luncheon at the plant of the Schlitz Brewery Co., which will be served by the courtesy of this company.

Evening—Reception, concert and dance, Juneau hall, Milwaukee Auditorium. Light refreshments will be served and handsome souvenirs will be given to the ladies.

Wednesday, Oct. 9

Coal and Coke

10:00 A. M.—Professional session, Engelmann hall.

Moving pictures on the triplex steel process.

"The By-Product Coke Oven and its Products," by W. H. Blauvelt, Syracuse, N. Y.

"The Use of Coal in Pulverized Form," by H. B. Collins, Fuller Engineering Co., Allentown, Pa.

"Carbocoal," by C. T. Malcolmson, Malcolmson Briquet Engineering Co., Chicago.

"Low-temperature Distillation of Illinois and Indiana Coals," by G. W. Traer, Universal Coal Products Co., Chicago.

"Price Fixing of Bituminous Coal by the U. S. Fuel Administration," by Cyrus Garnsey, R. V. Norris and J. H. Allport.

12:00 M.—The ladies will be served a Dutch lunch at the Schlitz palm garden. In addition to an orchestra, several noted speakers will be on the program.

Moving Pictures

3:00 P. M.—Plankinton hall.

Moving pictures on the construction of Concrete Ships.

Moving pictures on the civil re-establishment of crippled soldiers.

Submarines in action.

Torpedoes in action.

8:00 P. M.—Theater party, Majestic vaudeville house.

Thursday, Oct. 10

The plant visitation schedule given in the program of the Institute of Metals Division, preceding, will be followed.

Afternoon—Card party and tea for the ladies in the Badger room, Wisconsin Hotel. Handsome prizes will be awarded.

7:00 P. M.—Annual banquet, Milwaukee auditorium.

Friday, Oct. 11

The plant visitation schedule given in the program of the Institute of Metals Division, preceding, will be followed.

Manpower Savers at Metals Show

Two Large Halls Will be Filled With Exhibits of Machinery and Equipment at the Milwaukee Allied Metals Congress—Labor Savers Will be Displayed and Demonstrated

ABELL-HOWE CO., Chicago.—This company will exhibit trucks arranged for hand trucking and also equipped as trailers for trucking with power tractors. The operation of this truck in a foundry will be displayed by moving pictures and photographs. This exhibit also will include an electric hoist with foundry control as well as other equipment marketed by this company; represented by O. J. Abell, R. E. Stuntz and J. O. Humbert.

ABRASIVE CO., Philadelphia.—Abrasive wheels manufactured by this company for grinding cast iron, brass, bronze and all metals of low tensile strength will be exhibited. Also, boro-carbone wheels will be displayed which are used principally for grinding steel; represented by Clyde W. Blakeslee, Herbert A. Loomis, George J. Bassler and F. B. Miller.

ACME MACHINE TOOL CO., Cincinnati.—A universal flat turret lathe will be shown in operation; represented by Fred Winkelman, J. R. Pearson and A. J. Jones.

AIR REDUCTION SALES CO., New York.—Oxy-acetylene and cutting apparatus, oxy-acetylene generators and oxygen and acetylene compressed in cylinders will be displayed. Practical demonstrations of this equipment also will be made; represented by L. H. Atkinson, E. L. Mills, R. T. Peabody, E. M. Sexton and R. A. Sossong.

ALLIS-CHALMERS MFG. CO., Milwaukee.—Power plant equipment.

AMERICAN FOUNDRY EQUIPMENT CO., New York.—A sand cutting machine built by the Sand Mixing Machine Co. will be shown as well as a rotary table sand blast room of the humane type equipped with a table 9 feet in diameter and a new type rotary table sand blast cabinet. This exhibit will be made jointly with the Sand Mixing Machine Co., New York; represented by V. E. Minich, H. L. Wadsworth, Hutton H. Haley and John D. Alexander.

AMERICAN GUM PRODUCTS CO., New York.—Cores made with the binder manufactured by this company will be exhibited and castings produced by the use of these cores also will be shown; represented by Gordon I. Lindsay, W. E. Baird, O. B. Parker, A. J. Kies, M. F. Coughlin.

AMERICAN KRON SCALE CO., New York.—The automatic, springless dial scale built by this company will be shown and an attachment will be displayed which may be hooked onto beam scales thereby converting them into automatic scales without discarding the beam scale equipment; represented by E. Ohnell, C. F. Larson, E. M. Abramson, J. Kirk Rowell, Sykes and Kraber.

AMERICAN MOLDING MACHINE CO., Terre Haute, Ind.—The space of this company will be fitted up as an office and reception room; represented by W. C. Norcross and Louis J. Cox.

ARCADE MFG. CO., Freeport, Ill.—The molding machine exhibit to be made by this company will be operated and will include the Modern machine equipped with a plate for special work, air squeezers, combined jolter and squeezer, pouring device, plain jolting machines and a display of brass and iron castings of intricate design produced on these machines; represented by Henry Tscherning, August Christen, G. D. Wolfley, Mentor Wheat and R. E. Turnbull.

ARCWELL CORP., New York.

ARROW FORGING & TOOL WORKS, Chicago.—All kinds of chipping tools for use in foundry cleaning rooms will be shown; represented by L. G. Groesal and Alvin F. Kunz.

ASBURY GRAPHITE MILLS, Asbury, N. J.—The extensive line of graphite products manufactured by this company will be shown, including foundry facings, boiler graphite, graphite for crucibles, etc.; represented by H. M. Riddle, Jr.

ATKINS, E. C., & CO., Indianapolis.—This exhibit will consist of motor-driven metal cutting machines, metal cutting saws, hack saw blades, pattern plates, etc.; represented by T. A. Carroll, T. H. Endicott, G. W. Steenbergh and Lewis Okey.

AUSTIN CO., Cleveland.—A pictorial display will be made of this company's method of 30-day building construction. A model of a standard building will be exhibited, as well as samples of essential materials used. A series of photographs illustrating the Austin standard buildings for foundries and machine shops also will be shown; represented by G. A. Bryant, W. L. Bailey, W. F. Chambers, G. A. Dodge and W. L. Towne.

BADGER-PACKARD MACHINERY CO., Milwaukee.—The extensive line of iron and woodworking machinery, transmission meters and machinists' supplies, as well as electrical equipment handled by this company will be displayed. This will include a universal woodworker built by the Sidney Machine Tool Co., Sidney, O.; turret lathe, built by the W. K. Millholland Machine Co., Indianapolis; shaper, by John Steptoe Co., Cincinnati; tool and cutter grinder, by Oesterlein Machine Co., Cincinnati; five-spindle automatic drilling and vertical drilling machines, by the Detroit Tool Co., Detroit; motor-driven, geared head lathe, by the Monarch Machine Tool Co., Sidney, O.; electric grinding tools, by the Wisconsin Electrical Co., Racine, Wis.; electric glue heating apparatus, by the International Electric Co., Indianapolis; and motors, by the Lincoln Electric Co., Cleveland; represented by C. A. Schuman, W. D. Romaine, Paul Sladky, H. S. Molony and E. G. White.

BARRETT CO., Chicago.—This space will be fitted up as a reception and rest room; represented by H. M. Wilson and H. R. Hansen.

BASTIAN-BLESSING CO., Chicago.—A complete line of welding and cutting apparatus will be exhibited. Attention will be directed to recent improvements in welding and cutting equipment whereby the flash-back has been eliminated; represented by L. G. Blessing, M. Keith Dunham, F. W. Munson.

BATTLE CREEK SAND SIFTER CO., Battle Creek, Mich.—Air-driven, as well as hand and belt-driven sand sifters will be shown. These will be equipped with 16 x 28-inch screens of the no-sag type. Sprayers for blacking cores and molds, as well as safety deposit boxes also will be exhibited; represented by R. R. Wilder.

BERKSHIRE MFG. CO., Cleveland.—The extensive line of molding machines to be shown by this company will be operated and will include an air squeezer equipped with a split pattern plate, air squeezer equipped with stripping plate, air squeezer equipped with match plate with special device for closing the mold on the machine without removing the cope, and an air squeezer equipped with an aluminum match plate. Molding machine accessories such as vibrators, knee valves, blow-off valves, etc., also will be displayed; represented by W. D. Fraser and G. L. Cannon.

BIRKENSTEIN, S., & SONS, Chicago.—The extensive line of nonferrous metals in ingot form produced for the brass foundry trade by this company will be displayed, including ingot brass, ingot bronze, pig copper, aluminum, manganese bronze, pig tin, pig lead, solder, babbitt, phosphor-copper and phosphor-tin. In addition, castings from these products also will be shown; represented by H. Birkenstein, C. Raphael, M. Isaacson, N. Stohm, H. Goldstine, M. Schero and S. Pflaum.

BLODGETT, G. S., Co., Burlington, Vt.—Two types of portable core ovens will be exhibited which may be used for testing for baking small cores, for annealing, japanning, hardening and drying; represented by R. L. Patrick.

BLYSTONE MFG. CO., Cambridge Springs, Pa.—A 7-cubic foot, motor-driven core sand mixer, equipped with a revolving screen will be shown in operation; represented by L. G. Conroe and A. W. Ferguson.

BRISTOL MACHINE TOOL CO., Bristol, Conn.—The equipment manufactured by this company will be exhibited by the Federal Machinery Sales Co., Chicago.

BROWN SPECIALTY MACHINERY CO., Chicago.—Three styles of machines for making cores, ¼ to 7 inches in diameter, will be shown, as well as an 84-inch rotary table sand-blast machine and a pneumatic charging truck for malleable iron annealing ovens; represented by Elmer A. Rich, Jr., J. E. Sweet, H. T. Rich, John Laycock and Robert L. Laycock.

BUCKEYE PRODUCTS CO., Cincinnati.—Both crucible and noncrucible melting furnaces which may be operated with different fuels will be exhibited, together with oil and gas burners, compressed air and electric vibrators, parting compounds, high temperature furnace cement, metal fluxes, core compounds and core oils, snap flask guides, mold driers, annealing and core drying ovens, crucible hold back device and a general line of foundry supplies; represented by C. J. Goehringer, R. B. Ferguson, B. Bernbaum, C. Gysin and E. L. Bunting.

CARBORUNDUM CO., Niagara Falls, N. Y.—An extensive display will be made of abrasive wheels and abrasive materials for use by the foundry trade, including grains, discs, abrasive cloth and granite paper for pattern shop use; represented by Anthony Dobson, Edw. Edwards, J. M. Engman, Benjamin Lere, R. C. Bradbury, H. E. Kerwin and W. E. Knott.

CAULKINS-CARPENTER CO., Chicago.—The adjustable, semi-automatic jig built by this company, which permits of performing drilling operations without interruption or loss of time on account of loading or unloading the jig, will be shown. In addition, a sensitive drilling, tapping and boring machine and a portable electric shop fixture will be displayed; represented by C. Y. Carpenter.

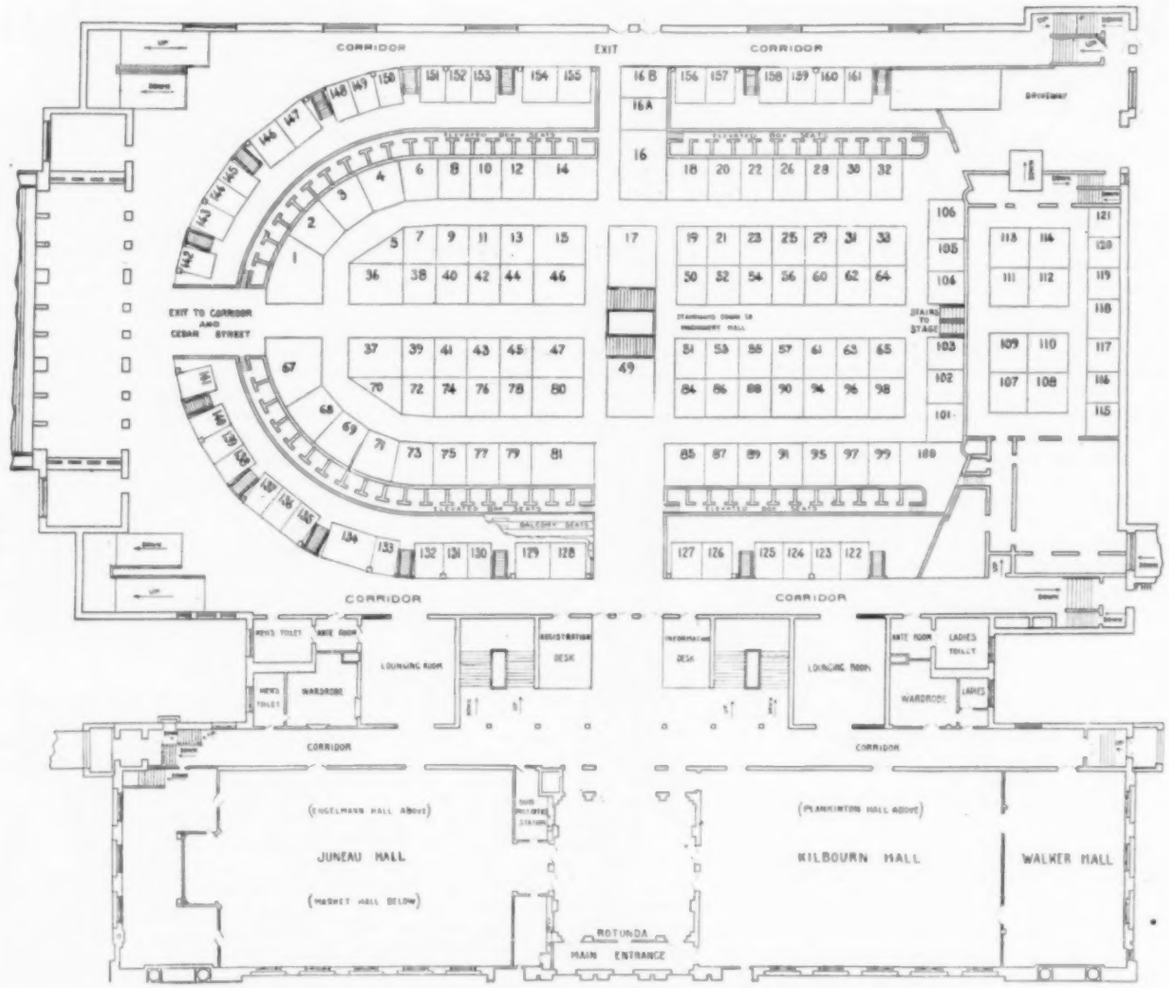
CENTRAL ELECTRIC CO., Chicago.—Industrial lighting units and heavy duty plugs and receptacles for electrical work will be exhibited; represented by G. M. Cox.

CHAMPION FOUNDRY & MACHINE CO., Chicago.—An electrically-driven sand riddle and a jolt-ramming roll over power draw molding machine for making cores and molds will be shown in operation; represented by T. J. Magnuson, H. O. Magnuson and Anton Magnuson.

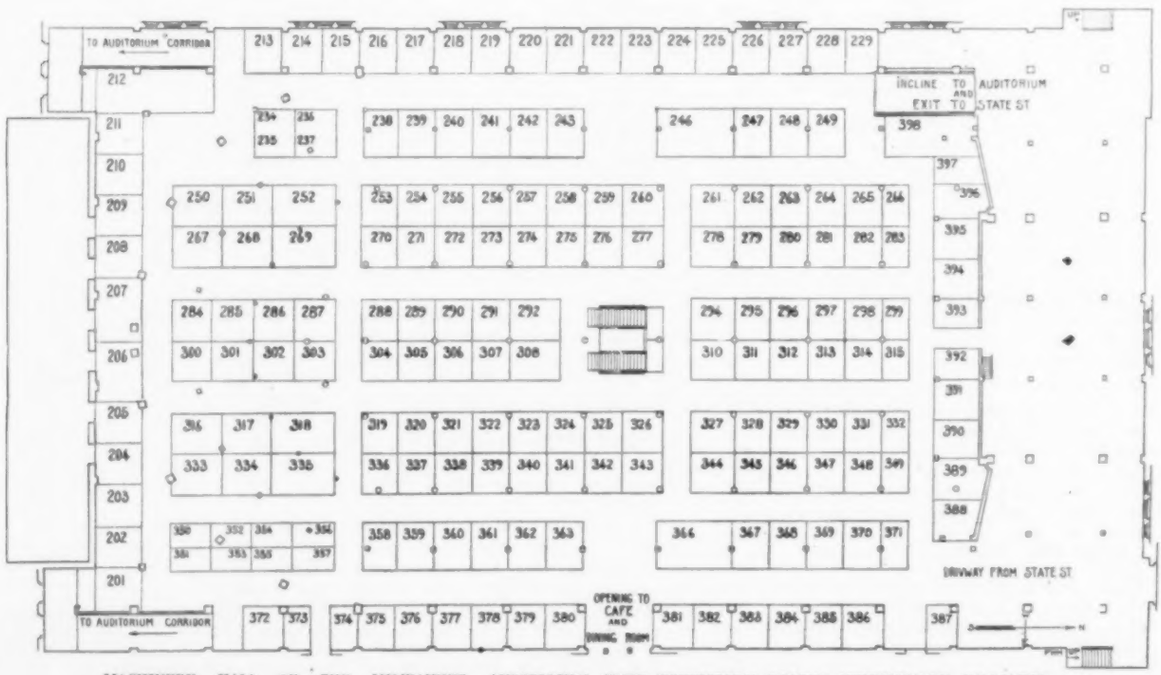
CHASE, FRANK D., INC., Chicago—Enlarged photographs of plants built by this company will be displayed; represented by Frank D. Chase, T. K. Webster, Jr., W. H. Lieneach, A. A. Wickland, Morris W. Lee.

CINCINNATI PULLEY MACHINERY CO., Cincinnati.—A complete line of different sizes of ball-bearing drilling machines as well as high duty pulley lathe will be exhibited; represented by J. G. Hey, C. K. Cairns, J. F. Mirrielees and D. A. Patterson.

CLARK, CHARLES J., Chicago.—Blast volume meters of various types and capacities for application to cupolas and malleable furnaces will be exhibited. One meter will be connected to a blower to demon-



THE ARENA OF THE MILWAUKEE AUDITORIUM, WITH EXHIBITORS' BOOTHS NUMERICALLY INDICATED


TO AUDITORIUM CORRIDOR
INCLINE TO AND EXIT TO AUDITORIUM STATE ST
DRIVEWAY FROM STATE ST
TO AUDITORIUM CORRIDOR
OPENING TO CAFE AND DINING ROOM

MACHINERY HALL OF THE MILWAUKEE AUDITORIUM, WITH EXHIBITORS' BOOTHS NUMERICALLY INDICATED

Exhibitors in the Arena

No. of Booth	Exhibitor
107-110	Allis-Chalmers Mfg. Co.
12-14	American Gum Products Co.
29	American Kron Scale Co.
16A	Arcwell Corp.
102	Asbury Graphite Mills.
106	Austin Co.
103	Barrett Co.
55	Birkenstein, S., & Sons.
73	Blodgett, G. S., Co., Inc.
61	Brass World Publishing Co.
75	Chase, Frank D., Inc.
100, 101	Coale, Thomas, E., Lumber Co.
26	Combined Supply & Equipment Co.
20, 22	Corn Products Refining Co.
51, 53	Dixon, Joseph, Crucible Co.
19, 21, 24, 50, 52, 54	*Daily Iron Trade and Metal Market Report.*
115	Erwin Mfg. Co.
94	Foreign Crucibles Corp.
19, 21, 23, 50, 52, 54	*Foundry, The*
79	Foundry Equipment Co.
56	Garden City Sand Co.
111-114	General Electric Co.
89, 91	General Steel Co.
105	Gordon Sand Co.
34	Hoevel Mfg. Co.
97	Holcomb Safety Garment Co.
37	Holland Core Oil Co.
95	Illinois Clay Products Co.
117	Industrial Electric Furnace Co.
45, 47, 78, 80	*Iron Age.*
19, 21, 23, 50, 52, 54	Iron Trade Review The.
98	Jennison-Wright Co.
96	Jurack, Chas., Pattern Works.
99	Kawin, Chas. C., Co.
6	Kellogg, Spencer & Sons.
77	Kelly, T. P., & Co., Inc.
63	King, Julius, Optical Co.
71	Laclede-Christy Clay Products Co.
119	Lane, H. M. Co.
16-B	Leeds & Northrup Co.
30	Loewenthal Co.
49	Lupton's, David, Sons Co.
81	McLain's System and McLain-Carter Furnace Co.
60	Maclean Publishing Co.
120, 121	Marden, Orth & Hastings Corp.
39	*Metal Industry.*
84, 86	Metal & Thermit Corp.
132	Mifflin Chemical Corp.
10	Monarch Engineering & Mfg. Co.
57	New Chicago Crucible Co.
135	New Era Mfg. Co.
11, 13, 15, 42, 44, 46	Obermayer, S., Co.
4	Pawling & Harnischfeger Co.
116	Peck Iron & Steel Works.
19, 21, 23, 50, 52, 54	Penton Publishing Co.
34	Pettinos, George F.
1, 2	Pickands, Brown & Co.
89, 91	Pittsburgh Furnace Co.
104	Portage Silica Co.
25	Progressive Metal & Refining Co.
85, 87	Quigley Furnace Specialties Co.
88, 90	Robeson Process Co.
17	Rogers, Brown & Co.
70	Shepard Electric Crane & Hoist Co.
118	Sheriffs Mfg. Co.
31, 33, 62, 64	Sly, W. W., Mfg. Co.
65	Smith, R. P., & Sons Co.
16	Smith, Werner G., Co.
8	Standard Optical Co.
67, 68	Sterling Wheelbarrow Co.
41	Stevens, Frederic B.
	Stodder, W. F.
43	Strong, Kennard & Nutt Co.
69	Swan & Finch Co.
28	United Compound Co.
76	United States Graphite Co.
18	United States Silica Co.
	Wangelin, Walter H., & Co.
32	Wheeler, F. H., Mfg. Co.
5, 7, 9, 36, 38, 40	Whiting Foundry Equipment Co.

Exhibitors in Machinery Hall

No. of Booth	Exhibitor
318	Abell-Howe Co.
290	Abrasive Co.
368	Acme Machine Tool Co.
387	Air Reduction Sales Co.
213-220	American Foundry Equipment Co.
	American Molding Machine Co.
253, 4, 5-270, 1, 2	Arcade Mfg. Co.
395	Arrow Forging & Tool Works.
381, 382	Atkins, E. C., & Co., Inc.
369, 370	Badger, Packard Machine Co.
385, 386	Bastian, Blessing Co.
396	Battle Creek Sand Sifter Co.
236, 237	Berkshire Mfg. Co.
291	Blystone Mfg. Co.
224-227	Brown Specialty Machinery Co.
263, 280	Buckeye Products Co.
308	Carborundum Co.
386	Caulkins-Carpenter Co.
206	Central Electric Co.
284	Champion Foundry & Machine Co.
342, 343, 341	Cincinnati Pulley Machinery Co.
315	Clark, C. J.
238-243	Cleveland Osborn Mfg. Co.
304, 305	Cleveland Pneumatic Tool Co.
307	Clipper Belt Lacer Co.
265, 266	Davenport Machine & Foundry Co.
378, 379, 380	Davis-Bournonville Co.
267, 268	Dayton Molding Machine Co.
230, 231	Deister Concentrator Co.
374, 375, 376	Dings Magnetic Separator Co.
362	Ellis, R. E. Engineering Co.
273, 274, 275	Federal Foundry Supply Co.
327, 8, 9-344, 5, 6	Federal Machinery Sales Co.
312	Foundry Appliance Co.
264	Foundrymen's Supply Co.
314	Freeman Mfg. Co.
337	Gibbons, James.
257, 258	Great Western Mfg. Co.
310, 311	Grimes Molding Machine Co.
300	Hauck Mfg. Co.
252	Hausfeld Co.
332	Haynes Stellite Co.
204, 205	Hayward Co.
286, 287	Herman Pneumatic Machine Co.
358	Hyatt Roller Bearing Co.
372	Imperial Brass Mfg. Co.
288, 289	International Molding Machine Co.
323,324	Kearney & Trecker Co.
319, 320	Kempsmith Mfg. Co.
256	Locke Patterns Works
333, 334	Ludlum Electric Furnace Co.
316, 317	McCormick, J. S. Co.
363	McCrosky Reamer Co.
249	MacLeod Co.
207	Magnetic Mfg. Co.
209	Mahr Mfg. Co.
351	Mail-o-meter Sales Co.
367	Marshall & Huschart Machinery Co.
285	Maxon-Premix Burner Co.
201	Milburn, Alexander, Co.
330	Modern Tool Co.
256	Monroe Calculating Machine Co.
292	Mumford Molding Machine Co.
340	Napier Saw Works
246	National Engineering Co.
250	New Haven Sand Blast Co.
281, 282, 283	Nicholls, Wm. H., Co. Inc.
306	Norma Co. of America.
301, 302, 303	Norton Co.
321, 322, 338, 339	Oliver Machinery Co.
208, 221, 222, 223	Oxweld Acetylene Co.
210, 211, 212	Pangborn Corp.
336	Peerless Machine Co.
331	Phoenix Mfg. Co.
261, 262, 278, 279	Pridmore, Henry E., Inc.
347	Racine Tool & Machine Co.
390, 391, 392	Railway Mechanical Engineer.
	Republic Creosoting Co.
335	Richards-Wilcox Mfg. Co.
348, 349	Rivett Lathe & Grinder Co.
228, 229	Rothacker Film Mfg. Co.
213-220	Sand Mixing Machine Co.
373	Schroeter Engineering Co.
356, 357	Simonds Mfg. Co.
203	Standard Sand & Machine Co.
397, 398	Sullivan Machinery Co.
202	Syracuse Sander Mfg. Co.
247, 248	Tabor Mfg. Co.
361	Thomas Elevator Co.
388, 389	Torchweld Equipment Co.
259, 260, 276, 279	U. S. Molding Machine Co.
251	Wadsworth Core Machine & Equipment Co.
269	Wallace, J. P., & Co.
352	Wangelin, Walter H., & Co.
325, 326	Warner & Swasey Co.
353	Western Electric Co.
294, 299	Woodison, E. J., Co.
393, 391	Young Bros. Co.

strate its method of operation. A special type of mercury pressure gage for foundry use also will be shown; represented by Charles J. Clark and Frederick G. Klee.

CLEVELAND OSBORN MFG. CO., Cleveland, O.—Practically all of the various types of molding machines manufactured by this company will be shown in operation and will include a direct-draw roll over machine, jolt stripping plate machine, combination jolt stripping squeezer, combination jolt squeezer, plain air squeezer, plain jarring machine and roll over machine and a hand operated stripping plate machine; represented by H. R. Atwater, E. S. Carman, J. C. Alberts, E. J. Byerlein, E. T. Dodderidge, H. E. Deakins, E. Q. Jacobi and F. T. Spikerman.

CLEVELAND PNEUMATIC TOOL CO., Cleveland, O.—An elaborate display will be made of the complete line of air tools manufactured by this company, consisting of air drills in all sizes, sand rammers, core breakers, chipping hammers, riveting hammers, emery grinders, valve grinders, air hose coupling, air valves, fittings, hose clamps and air hose; represented by H. S. Covey, Arthur Scott, C. D. Garner, H. C. Newton, Captain F. H. Burr, F. E. Schwarze and Guy Gregory.

CLIPPER BELT LACER CO., Grand Rapids, Mich.—Belt lacer machines, belt hooks and pins and photographs illustrating various uses of belt lacing and its adaptability to various conditions, as well as sample joints, will be displayed; represented by Paul P. Rohns and P. E. Crothers.

COALE, THOMAS E., LUMBER CO., Philadelphia.—An unusually interesting display of Michigan white pine and genuine Madera California sugar pine pattern lumber will be made; represented by Thomas E. Coale, A. W. Anderson and E. C. Anderson.

COMBINED SUPPLY & EQUIPMENT CO., Buffalo.—Angle stem chaplets will be exhibited; represented by S. LeViness, Jr., and C. L. Jackson.

CORN PRODUCTS REFINING CO., New York.—Cores made with core binders manufactured by this company will be produced and baked in an oven constituting a part of this company's exhibit. A liquid core binder also will be shown. An interesting and valuable booklet on coremaking written by Richard Moldenke, which contains new and important facts relating to coremaking will be distributed; represented by Dr. W. R. Cathcart, F. G. Faller, Jr., H. S. Karch, D. T. McGrory, J. A. Oates.

DAILY IRON TRADE AND METAL MARKET REPORT, Cleveland.—This booth will be fitted up as a rest room for visitors, where all are invited to make their headquarters; represented by John A. Penton, A. O. Backert, J. D. Pease, H. Cole Estep, Charles J. Stark, R. V. Sawhill, V. G. Iden, George H. Manlove, H. S. Jasper, G. O. Hayes, A. L. Klingeman, F. V. Cole, L. C. Pelott and D. M. Avey.

DAVENPORT MACHINE & FOUNDRY CO., Davenport, Ia.—The extensive line of molding machines manufactured by this company will be exhibited; represented by Edward Whitaker, A. D. Ziebarth, A. V. Magnuson and Carl Falk.

DAVIS-BOURNONVILLE CO., Chicago.—The equipment to be displayed by this company will be shown in operation. This will reflect the great advances made in the use of machinery for oxy-acetylene cutting and welding. These machines will include an oxygraph which will occupy a space 8 x 16 feet; another machine of this type which makes one cut only and which will occupy a space 8 x 7 feet, and a radiagraph will be exhibited adapted for both light and heavy cutting of steel up to 36 inches in thickness. This machine will occupy a space of 6 x 4 feet. The magnetograph to be shown is designed for cutting circles in steel plates. A duplex oxygen manifold for making oxygen tanks also will be exhibited. A cabinet truck which will accommodate acetylene and oxygen tanks and which contains a welding unit with two sizes of torches as well as a cutting unit, will also be shown; in addition, there will be displayed a pressure generator, a complete line of torches, regulators and tips; represented by R. O. Mueller, C. F. Williams, A. C. Collins, J. R. Wilson, Fred Maeurer, H. Bird and W. R. Noxon.

DAYTON MOLDING MACHINE CO., Dayton, O.—The molding machines to be displayed by this company will be shown in operation and will include a 28-inch jolt rock over draw machine with a 12-inch draw, 12-inch jolt squeezers and 16 x 16-inch jolt squeezer pattern machines; represented by T. J. Mumford II., H. W. Sinclair, J. A. Walsh and G. W. Smith.

DEISTER CONCENTRATOR CO., Ft. Wayne, Ind.—This exhibit will consist of a laboratory size Deister Overstrom diagonal deck table which will be operated, but no material will be run over it. However, samples of material that have been treated on thees tables will be displayed. This table is designed for the treatment of foundry residue. In addition to this exhibit, the Dings Magnetic Separator Co., Milwaukee, will place one of its magnetic separators in this booth in order to show the close relationship of the two machines in the handling of residue; represented by E. J. O'Connell and B. J. Roberts.

DINGS MAGNETIC SEPARATOR CO., Milwaukee.—Various types of the magnetic separators built by this company will be shown in operation. These will include a machine with a motor generator set, another separator with a motor and a large diameter magnetic pulley which will demonstrate the magnetic strength of one of these units. In addition, a separator adapted for use in smelting and refining works also will be shown. The separator equipped with a motor is used in gray iron, steel and malleable foundries for removing the iron ordinarily wasted in the dump. The machine equipped with a motor generator set is used in brass and aluminum foundries as well as in smelting and refining works and is particularly adapted for handling borings and turnings. A magnetic separator made by this company also will be installed in the booth of the Deister Concentrator Co. to demonstrate its application to the separation of the concentrates from their table which consists of both ferrous and nonferrous metals. In addition to this exhibit in Machinery Hall, space has been reserved in the Arena which will be used as a reception room and in which also will be displayed a small magnetic separator; represented by R. A. Manegold, E. S. Hirschberg, G. H. Fobian, R. Kretchmar.

DIXON, JOSEPH, CRUCIBLE CO., Jersey City, N. J.—A general list of graphite products will be shown, including crucibles, stoppers, nozzles, sleeves, stirrers, etc. An unusually complete display of automobile lubricants will be made as well as motor brushes, graphite paint, etc.; represented by H. C. Sorenson, F. R. Brandon, W. B. Allen, D. A. Johnson, A. L. Haas's and George Neighbor.

ELLIS, R. E., ENGINEERING CO., Chicago.—An extensive line of metal-working equipment will be exhibited by this company, including air-operated chucks and equipment, automatic die heads and taps, production reamers and boring bars, adjustable reamers and drill chucks, oil and gas-burning furnaces, auxiliary multiple spindle drill heads, deep hole drilling machines, hydraulic presses, etc.; represented by R. E. Ellis, Fred Fisher, F. Alexander Roger, R. A. Braunberger and C. D. Gordon.

ERWIN MFG. CO., Milwaukee.—Fire extinguishers of various sizes of both copper and steel construction will be exhibited as well as portable engines for extinguishing fires; represented by J. G. Erwin.

FEDERAL FOUNDRY SUPPLY CO., Cleveland.—An extensive display will be made of molding machines, snap flasks, slip jackets, chaplets, etc.; represented by W. J. Adams, Ralph Ditty, John Bayer, W. J. Smith, E. Kaye, George A. Fuller, T. H. Terry and F. L. Ditty.

FEDERAL MACHINERY SALES CO., Chicago.—An extensive display of machine tools will be made which will be shown in operation. These will include a 20-inch x 10-foot motor-driven Greaves-Klusman, quick-change gear engine table; a Gooley & Edlund motor-driven milling machines; several Henry & Wright high speed ball bearing drills; a Bristol motor-driven ring grinder; two Bristol hand milling machines, belt-driven; Oakley universal cutter and tool grinder and a Southworth screw machine; represented by James L. Gough, H. L. Cole.

FOREIGN CRUCIBLE CORP., New York.—Samples of French graphite, crucibles, will be exhibited; represented by George H. Ames.

FREEMAN MFG. CO., Racine, Wis.—Molding machines.

FOUNDRY, THE, Cleveland.—This booth will be fitted up as a rest room for the visitors where all are invited to make their headquarters; represented by John A. Penton, A. O. Backert, J. D. Pease, H. Cole Estep, Charles J. Stark, R. V. Sawhill, V. G. Iden, George H. Manlove, S. H. Jasper, G. O. Hays, A. L. Klingeman, F. V. Cole, L. C. Pelott and D. M. Avey.

FOUNDRY APPLIANCE CO., Newark, N. J.—A device for handling the cope for drawing patterns on power squeezers will be displayed; represented by J. N. Frantz and D. B. Diss.

FOUNDRY EQUIPMENT CO., Cleveland.—No equipment will be shown by this company, but a large number of enlarged photographs will be displayed of installations of core and mold ovens, core and mold cars, aluminum and brass melting furnaces, etc.; represented by F. A. Coleman and C. A. Barnett.

FOUNDRYMEN'S SUPPLY CO., Milwaukee.—The molding machines manufactured by this company will be shown in operation. In addition, this exhibit will include a display of vibrators and samples of different grades of mold and core sand, fire clay and silica wash; represented by Mr. Holland.

GARDEN CITY SAND CO., Chicago.—Samples of molding sands, fire brick furnace sands, fire clay, etc., will be exhibited; represented by William Chambers.

GENERAL ELECTRIC CO., Schenectady, N. Y.—Enlarged photographs will be displayed showing General Electric apparatus and lantern slides will be projected to illustrate the foundry applications of these products; represented by L. W. Shugg.

GENERAL STEEL CO., Milwaukee.—Steel billets, steel bars and other steel products manufactured by this company will be shown and photographs illustrating this company's mill and equipment also will be displayed; represented by R. C. Gosrow, W. E. Moore, E. Gruhl and F. E. Patton.

GORDON SAND CO., Conneaut, O.—This booth, which essentially will be fitted up as a rest room, also will contain a display of the samples of the extensive line of molding sand mined by this company for the production of aluminum, brass, gray and malleable iron castings; represented by F. E. Gordon, Warner R. Thompson, W. E. Thompson and Taylor H. Boggis.

GREAT WESTERN MFG. CO., Leavenworth, Kans.—Three types of gyratory foundry riddles manufactured by this company will be shown in operation; represented by George W. Combs and F. A. Pickett.

GREAVES-KLUSMAN TOOL CO., Cincinnati,.—The display of machine tools to be made by this company will be shown in the space of the Federal Machinery Sales Co., Chicago. It will consist of a 20-inch x 10-foot all-geared head lathe of the single lever control type, which provides 10 speeds with one lever and also permits of starting, stopping and reversing the machine.

GRIMES MOLDING MACHINE CO., Detroit.—The molding machine exhibit to be made by this company will be shown in operation and will include a jar-ramming roll over molding machine, hand-ramming roll over molding machine and a small coremaking machine; represented by George L. Grimes, Charles J. Skeffington and L. V. Grimes.

HAUCK MFG. CO., Brooklyn, N. Y.—Oil-burning outfits for lighting cupolas, ladle heaters, mold driers, preheating torches for welding operations, kerosene torches and furnaces, oil fuel furnace burners, rivet sets and annealing furnaces will be shown; represented by A. Busch Hauck, Willis C. Squire and H. E. Giersche.

HAUSFELD CO., Harrison, O.—An open flame, non-crucible furnace; crucible tilting furnace and an aluminum furnace will be exhibited. These are adapted for operation with natural or artificial gas, or fuel oil. Other parts of this display will include vibrators as well as samples of a highly refractory cement made by this company; represented by J. S. Annom, Joseph E. Hausfeld and C. E. Haddock.

HAYNES STELLITE CO., Kokomo, Ind.—Several grades and styles of arc-welded and butt-welded bits, milling cutters, end mills, etc., will be displayed.

Also dental and surgical and table cutlery, etc., will be shown. The latter exhibit will be made for demonstrating the possibilities of stellitic in this line of manufacture; represented by P. P. Hale and E. H. Lucker.

HAYWARD CO., New York.—An exhibt will be made of working models of clamshell and orangepeel buckets and an electric motor bucket of this type also will be shown in operation. In addition to the foregoing equipment, a collection of photographs illustrating this company's machines in operation in foundries and other industries will be displayed; represented by C. F. Hutchings and H. M. Davison.

HERMAN PNEUMATIC MACHINE CO., Pittsburgh.—A pain jar-ramming molding machine with a 13-inch cylinder and provided with a 40 x 50-inch table, will be shown; represented by H. T. Frauenheim, Robert Ringle, I. J. Oesterling, R. P. Morgan, Robert Porteous, W. W. Hughes, C. S. McMath and Thomas Kaveny.

HOEVEL MFG. CORP., New York.—This exhibit will be made in connection with that of George F. Pettinos, Philadelphia, and will consist of photographs of the sand-blast equipment built by this company; represented by L. B. Passmore.

HOLCOMB SAFETY GARMENT CO., Chicago.—A complete line of safety garments for the protection of workers in steel, brass, iron and other metals will be exhibited; represented by C. R. Holcomb and A. F. Cutter.

HOLLAND CORE OIL CO., Chicago.—Samples of core oils, dry binders, parting compounds and core wash will be exhibited and sample cores also will be displayed, made in foundries using the core binders in their mixtures produced by this company; represented by H. L. Baumgardner, Garrett W. Doty, James M. O'Hara, Harry Whiting, R. E. Pickerell, Seth Vining, Sam Dykstra and A. G. Chambers.

HYATT ROLLER BEARING CO., New York.—The diversity of applicaations of roller bearings to foundry equipment of all kinds will be demonstrated. This will include roller bearing-equipped I-beam trolleys, complete counter-shaft bearings, two small test cars, one equipped with roller bearings and one with plain bearings mounted on a T-rail to demonstrate the easy running qualities of roller bearing-equipped cars; roller bearings mounted in glass tubing and revolved by an electric motor to demonstrate the oil-distributing function of this bearing; a small model of a steel mill roller table equipped with roller bearings in self-aligning housings; an industrial truck wheel showing how easily these roller bearings are applied to a truck; samples of roller bearings used in all kinds of machinery and samples of line shaft roller bearings; represented by D. Gleisen, E. E. Eby, T. P. Cunningham, G. O. Helmstaedter, P. C. Gunion.

ILLINOIS CLAY PRODUCTS CO., Oglesby, Ill.—Fire clay products.

IMPERIAL BRASS MFG. CO., Chicago.

INDUSTRIAL ELECTRIC FURNACE CO., Chicago.—Enlarged photographs of electric furnace installations will be shown and the booth will be fitted up as an office and rest room; represented by C. B. Fletcher, F. Von Schegel, Geo. B. Cross and Russell T. Gray.

INTERNATIONAL MOLDING MACHINE CO., Chicago.—When this was written this company was unable to state definitely whether any of its molding machines would be available for exhibition purposes. However, it is probable that several of these machines may be diverted temporarily for this purpose; represented by Edward A. Prudmore, W. W. Miller, F. W. Hamel, M. J. Monahan and E. G. Borgnis.

IRON TRADE REVIEW, THE, Cleveland.—This booth will be fitted up as a rest room for visitors where all are invited to make their headquarters; represented by John A. Penton, A. O. Backert, J. D. Pease, H. Cole Estep, Charles J. Stark, R. V. Sawhill, V. G. Iden, George H. Manlove, S. H. Jasper, S. O. Hays, A. L. Klingeman, F. V. Cole, L. C. Pelott and D. M. Avey.

JENNISON-WRIGHT CO., Toledo, O.—Creosoted wood blocks for foundry and machine shop floors will be exhibited and, in addition, enlarged photographs of foundries and machine shops equipped with these floors will be shown; represented by F. E. Jennison, F. M. Enwright, L. T. Ericson, R. R. Hone, J. A. Smith and H. M. Newton.

JURACK, CHARLES, PATTERN WORKS, Milwaukee.—An assorted line of snap flasks will be displayed; represented by Charles G. Jurack.

KAWIN, CHARLES C., CO., Chicago.—The booth of this company will be fitted up as a reception room where the representatives of this company may meet their clients and prospective clients; represented by Charles C. Kawin, J. F. Nellis, Charles A. LaFever, J. H. Hopp, James Jordan, William J. Mulcahy, A. M. Knight and R. F. Mains.

KEARNEY & TRECKER CO., Milwaukee.—The machine tool exhibit to be made by this company will be operated and will include vertical and plain milling machines; represented by E. J. Kearney, Theodore Trecker, J. A. Camm, W. H. Allen and C. C. Bauschke.

KELLOGG, SPENCER & SONS, INC., Buffalo.—The extensive line of core oils manufactured by this company will be exhibited; represented by A. P. Mason, J. N. Yaeger and E. G. Allen.

KELLY REAMER CO., Cleveland.—Boring and reaming tools and floating reamers will be displayed; represented by John M. Davie and James Gibbons.

KELLY, T. P., & CO., New York.—The booth of this company will be fitted up as a reception and rest room; represented by V. J. Rohe, E. L. Schenck, H. J. Winters, J. F. Walter and Walter F. Kaine.

KEMPSMITH MFG. CO., Milwaukee.—The motor-driven milling machine built by this company will be shown in operation; represented by Paul E. Thomas, John Goetz, Peter Lowe, F. M. Butterfield and Charles Drewes.

KING, JULIUS, OPTICAL CO., Chicago.—A complete line of safety eye protectors, welders' helmets, babbitting masks and welding goggles will be displayed; represented by J. J. Duffy and A. G. Larson.

LACLEDE-CHRISTY CLAY PRODUCTS CO., St. Louis.—Fire brick, fire clays and sleeves, nozzles and tuyeres for use by steel casting manufacturers will be exhibited; represented by J. H. McKelvey and E. C. Little.

LANE, H. M., CO., Detroit.—Photographs illustrating foundries recently designed by this company, together with blue prints showing core racks, core ovens, skew cranes, etc., will be exhibited; represented by H. M. Lane, A. O. Thomas, Benjamin Towlen and H. VE. Mills.

LEEDS & NORTHRUP CO., THE, Philadelphia—A curve drawing temperature recorder that will automatically operate signal lights and a deviation meter at the furnace; also a multiple point recorder which will do the same work with the exception that it will take care of a number of thermocouples, will be exhibited; represented by G. W. Tall, Jr., and Henry Brewer.

LOCKE PATTERN WORKS, Detroit.—The complete metal pattern equipment for making a 155-millimeter howitzer shell will be exhibited, as well as mahogany patterns for government liberty trucks and an assortment of cast and aluminum plates for small parts of government tractors; represented by D. H. Locke.

LOEWENTHAL CO., Chicago.—Yellow brass composition and remelted aluminum ingots will be displayed and castings produced from this metal also will be shown; represented by Edward B. Friedlander, Victor J. Loewenthal, Jos. T. Yabitz, Samuel Livingston, Harry Seidenburg, A. O. Mason, Jr.

LUDLUM ELECTRIC FURNACE CORP., Chicago.—A model of the electric furnace built by this company will be shown, which will represent a furnace in actual operation. In addition, enlarged photographs will be displayed of this company's furnaces as installed; represented by H. E. Randall, Glen B. Hastings and John Kelley.

LUPTON'S, DAVID, SONS CO., Philadelphia.—Samples and models of the various types of steel sash manufactured by this company will be exhibited and a large number of photographs will be displayed showing examples of these installations and their use, as well as foundries of the Pond truss design; represented by Clark Pond, C. P. F. Buckwalter and R. A. Sanborn.

McLEOD CO., Cincinnati.—Foundry equipment.

McCORMICK, J. S., CO., Pittsburgh.—A general line of foundry supplies and facings will be shown; represented by J. S. McCormick, T. E. Malone, S. R. Costley, A. T. Richardson and S. M. Sheppard.

McCROSKY REAMER CO., Meadville, Pa.—The quick-change drill chuck with collets, made by this company, will be shown in operation. This chuck enables the operator to change tools without stopping his machine. This chuck will be in operation on a Reed-Prentice machine and, in addition, this display will include turrets, adjustable inserted blade reamers in hand, machine and shell types and the spiral fluted type for machine purposes; represented by C. M. Sutton and M. J. Foulk.

McLAIN-CARTER FURNACE CO., Milwaukee.—Open-hearth steel castings poured from metal made in the McLain-Carter, oil-fired furnace will be displayed. Visitors interested in this steel process will be invited to inspect two of these furnaces in operation in Milwaukee; represented by David McLain, Frank Carter, Fred Smith and I. V. Scanlan.

McLAIN'S SYSTEM, INC., Milwaukee.—Samples of semi-steel castings of light section such as automobile cylinders containing from 20 to 50 per cent steel made by graduates from this school, will be displayed. Also, projectiles of 6-inch, 8-inch and other sizes containing 20 to 30 per cent steel scrap will be shown; represented by David McLain, I. V. Scanlan, Arthur Akey, Thomas McCarthy and Robert Moody.

MAGNETIC MFG. CO., Milwaukee.—A magnetic separator for use in iron, steel and malleable iron foundries will be exhibited. This separator is provided with an elevator so that the metal may be dumped or shoveled directly onto a grating in the floor and is elevated into the separator. The sand then is screened out of the material for future use. The iron is extracted from the balance of the material and any coke, slag or other lumps are discharged into a separate receptacle. Other equipment that will be shown will include a magnetic pulley, 18 inches in diameter x 24 inches, and a magnetic pulley type separator 12 inches in diameter x 18 inches. These separators are used in foundries for removing iron and steel from waste metal and may also be employed in bass foundries for the separation of iron and steel from brass and aluminum turnings. Two brass separators also will be displayed used for separating brass and iron turnings; represented by Alvin Dings, Roswell Stears and John P. Bethke.

MAHR MFG. CO., Minneapolis.—Fuel oil burning equipment will be exhibited, including oil burning torches for cupola lighting, mold drying, preheating, etc., oil burning ladle heaters and driers, fuel oil core oven burners, fuel oil rivet forges, fuel oil melting furnaces and fuel oil annealing furnaces; represented by H. H. Warner, A. E. Stenzel, C. M. Simonds and W. F. Bohnhoff.

MAIL-O-METER SALES CO., Chicago.—A tang for reclaiming any tang tool will be shown, as well as an automatic endorser and a machine for sealing, stamping and registering envelopes; represented by J. A. McFadyen.

MARDEN, ORTH & HASTINGS CORP., New York.—A core sand binder will be exhibited together with samples of cores made by the use of this binder. The samples will demonstrate how this binder can be mixed to reduce the cost of binding materials generally; represented by George N. Moore and H. M. Handy.

MARSHALL & HUSCHART MACHINERY CO., Chicago—This company will be represented at its various manufacturers exhibits by J. G. Klaiber, H. W. Jones, G. C. Edwards and J. R. Porter.

MAXON-PREMIX BURNER CO., Muncie, Ind.—Six different sizes of burners will be exhibited; represented by H. R. Maxon, M. W. Woodburn, R. P. Maynard, S. N. Maxon.

METAL & THERMIT CORP., New York.—A large weld on a crank shaft made by the thermit process will be exhibited and a complete line of samples of all of the carbon-free metals and alloys made by this company will be displayed. Demonstrations of welding pipes with thermit will be continued throughout the week; represented by Arthur F. Braid, H. G. Spilsbury, J. G. McCarthy, W. R. Hulbert and C. D. Young.

MIFFLIN CHEMICAL CORP., Philadelphia.—The core binder manufactured by this company for foundry

purposes will be exhibited; represented by P. Publicker and A. H. Selling.

MILBURN, ALEXANDER, CO., Baltimore.—An oxy-acetylene torch which may be employed for both cutting and welding, combining the two operations in a single unit and which is guaranteed against back-fire on either operation, will be displayed. A high pressure acetylene generator will be exhibited and operated. This machine carries a 10 per cent overload, which eliminates undue heating on standard charges of carbide. Portable carbide lights also will form a part of this exhibit; represented by Charles R. Pollard, Stewart B. Moats, Alexander R. Boas, David Bartlett.

MODERN TOOL CO., Erie, Pa.—An 8 x 18-inch, self-contained plain grinding machine will be shown in operation and other features of the exhibit will include self-opening and adjustable screw-cutting die heads, adjustable collapsible taps, solid dies, adjustable hollow milling tools, chuck and collet equipment and tapping attachments; represented by R. H. Wood, E. V. McConville and C. E. McArthur.

MONARCH ENGINEERING & MFG. CO., Baltimore. —An extensive display will be made of the line of metal-melting furnaces built by this company, as well as ovens and other foundry equipment. A new vertical tilting brass melting furnace without crucible also will be exhibited; represented by James J. Allen, Harry D. Harvey, Frank Maujean and William Rabor.

MONROE CALCULATING MACHINE CO., Chicago.—The calculating-adding machine built by this company will be exhibited. It not only adds, but subtracts, divides and multiplies; represented by Henry H. Doty, Walter H. Mann and Dorothy Drake.

MUMFORD MOLDING MACHINE CO., Chicago.—A 10-inch high trunnion squeezer will be shown and large photographs will be displayed illustrating the sprue cutter handled by this company; represented by J. T. Lee, O. F. Weiss, E. P. Pitfield and J. O. Clark.

NAPIER SAW WORKS, Springfield, Mass.—Band saw machines, band and hack saws, band, hack and circular saws will be exhibited; represented by B. L. Calkins, L. C. Howard, J. J. Pendergast and J. H. Green.

NATIONAL ENGINEERING CO., Chicago.—A foundry mixer 6 feet in diameter will be shown in operation. Photographs also will be displayed of a bucket loader, continuous core reducer, screen separator and other equipment essential to the mixing of sand in foundries; represented by H. S. Simpson.

NEW CHICAGO CRUCIBLE CO., Chicago.—All kinds of graphite crucibles and graphite greases will be shown; represented by Dr. Sherman Taylor, A. F. Hottinger, H. J. Lucas, J. R. Crowe, J. P. Foraker and J. W. Mann.

NEW ERA MFG. CO., Kalamazoo, Mich.

NEW HAVEN SAND-BLAST CO., New Haven, Conn. —Photographs of installations of the extensive line of sand-blast machines built by this company will be exhibited; represented by C. A. Dreisbach, C. E. Billings and C. S. Johnson.

NICHOLLS, WM. H., CO., INC., Brooklyn, N. Y.—A number of molding machines built by this company will be shown in operation, including combination jolt and power squeezer equipped with split pattern and stripping plates, plain jolt squeezer and plain jolt machine with a 6-inch piston and equipped with 24 x 36-inch table; represented by William H. Nicholls and H. P. Mackinson.

NORMA CO. OF AMERICA, New York.—Various types of ball and roller bearings manufactured by this company will be exhibited and their application to different kinds of machinery will be illustrated; represented by E. A. Perkins.

NORTON CO., Worcester, Mass.—A display will be made of grinding wheels especially adapted for foundry use, as well as those employed in the machine tool industry. In addition, refractory materials and rubbing bricks will be shown. A 2-inch floor grinder and a 1-inch bench grinder will be operated.

OAKLEY MACHINE TOOL CO., Cincinnati, O.—A universal cutter and tool grinder will be displayed; represented by R. L. Rickwood and A. A. Thayer.

OBERMAYER, S., CO., Chicago.—Coreovens, sprue cutters, tumbling barrels, ladles and miscellaneous foundry equipment and supplies will be exhibited; represented by S. T. Johnson, J. E. Evans, C. M. Barker, Wm. Fenton, W. H. Fitzpatrick, Jr., W. M. Fitzpatrick, Sr., J. J. McDevitt, G. P. Peterson, O. J. Peterson and A. N. Wallin.

OLIVER MACHINERY CO., Grand Rapids, Mich.—An extensive display of patternmaking machinery will be made, all of which will be operated. This will include a universal wood milling machine especially designed for making patterns that cannot otherwise be constructed by machine; a 16-inch universal saw bench; 30-inch disc and spindle sander and a motor head speed lathe designed especially for alternate current; revolving oilstone grinder for sharpening edge tools; 6-inch hand planer and jointer; embossing press for making letters and figures; patternmaker's bench and an 18-inch x 8-foot tool room engine lathe equipped with the usual tool room attachments, such as taper, relieving attachment, draw-in attachments, etc.; represented by A. S. Kurkjian, J. C. Whitney, R. F. Baldwin and W. D. Baldwin.

OXWELD ACETYLENE CO., Chicago.—This exhibit will include an oxweld generator and other apparatus for welding and cutting metals. This exhibit will be in charge of A. B. Rosenthal, George Rose, Carl Olson and E. D. Eddy. In addition the Prest-O-Lite Co., now represented by the Oxweld Acetylene Co., will have a working exhibit of Prest-O-Lite apparatus. This exhibit will be in charge of J. N. Walker and C. E. Sonday, L. E. Ogden.

PANGBORN CORP., Hagerstown, Md.—This operating exhibit will consist of new hygienic automatic sand-blast equipment complete with arrester system. This will comprise various types and sizes of machines to handle all classes of work, including a continuous feed, self-contained, stationary nozzle cabinet sand-blast; continuous feed, self-contained cabinet sand-blast with supported movable nozzle adjustable in every direction; table cabinet sand-blast provided with hygienic direct high pressure equipment for large work and a shell cleaning cabinet sand-blast of the automatic continuous suction feed type. An additional display will be made of castings, before and after sand-blasting and large photographs will be shown of works installations of this sand-blast equipment for various classes and volumes of work; represented by Thomas W. Pangborn, John C. Pangborn, H. D. Gates, W. C. Lytle, H. F. Liedtke, F. J. Hull, P. J. Trotter, A. L. Holmes, George A. Cooley and Charles T. Bird.

PAWLING & HARNISCHFEGER CO., Milwaukee.—This exhibit will include a ½-yard single line grab bucket and photographs will be displayed showing installations and detailed parts of cranes, hoists, grab buckets, drilling and boring machines and excavators; represented by Nicholas Prakken, A. G. Henricks, Ben Van Horn, C. W. Goyette, A. W. Greetham and E. F. Zeisig.

PECK IRON AND STEEL WORKS, Kalamazoo, Mich.—Various sizes of pressed steel foundry flasks and a complete line of steel slip jackets and bands will be displayed; represented by William W. Peck.

PEERLESS MACHINE CO., Racine, Wis.—Metal-cutting machines will be displayed; represented by James A. Farrell.

PENTON PUBLISHING CO., Cleveland.—This booth will be fitted up as a rest room for visitors where all are invited to make their headquarters; represented by John A. Penton, A. O. Backert, J. D. Pease, H. Cole Estep, Charles J. Stark, R. V. Sawhill, V. G. Iden, George H. Manlove, G. O. Hays, A. L. Klingeman, S. H. Jasper, F. W. Cole, L. C. Pelott and D. M. Avey.

PETTINOS, GEORGE F., Philadelphia.—Samples of crude graphites and molding sands will be shown; represented by George F. Pettinos, H. B. Taylor, Jr., and L. B. Passmore.

PHOENIX MFG. CO., Eau Claire, Wis.—A turret attachment for engine lathes will be shown; represented by I. B. Roland, Martin A. Hanson and W. L. Harrison.

PICKANDS, BROWN & CO., Chicago.—An unusually attractive display of by-product coke will be made which will consist of an officers' tent at headquarters built of by-product coke. Foundry coke will be used for the front, back and sides, and the roof will be constructed of the various crushed sizes of coke. A flag pole will be installed from which the national emblem will be flown and the surroundings will be suitably decorated with ferns and plants; represented by J. A. Galligan.

PITTSBURGH FURNACE CO., Milwaukee.—The electric furnace built by this company and installations thereof will be shown in a series of photographs; represented by R. C. Gosrow, W. E. Moore, E. Gruhl and E. V. Kane.

PORTAGE SILICA CO., Youngstown, O.—The sand-blast and silica steel foundry sand mined by this company will be exhibited, as well as samples of the rock from which this material is obtained. Photographs of this company's extensive plant also will be exhibited; represented by E. E. Klooz and L. R. Farrell.

PRIDMORE, HENRY E., Chicago.—The extensive line of molding machines to be displayed by this company will be shown in operation and will include a 24-inch, 9-inch drop combination electric jar-ramming and air power rock over hand draw machine; 24 x 24-inch, 8-inch draw combination electric jar-ramming and air power stripping plate machine; 16-inch, 9-inch drop combination electric jar-ramming and hand rock over drop machine; 29 x 24-inch, 8-inch drop power rock over drop machine; 22 x 18-inch, 8-inch drop rock over drop machine; 14 x 12-inch, 3-inch drop rock over drop core machine; 12 x 12-inch square stand machine and heavy double shaft stripping plate machine; represented by Mrs. Henry E. Pridmore, Henry A. Pridmore, Marshall Pridmore, D. F. Eagan, C. H. Ellis, J. W. Dopp, Hugh Gallagher, Henry G. Schlichter.

PROGRESSIVE METAL & REFINING CO., Milwaukee.—An extensive display will be made of all kinds of brass and bronze ingots, virgin metal such as lake copper, spelter, aluminum, antimony, tin and other nonferrous metals, as well as 98 to 99 per cent pure ingot aluminum, No. 12 aluminum ingots, brick copper, white metals, etc.; represented by Sol Sadek, Max Sadek, Michael Sadek and Sam Sadek.

QUIGLEY FURNACE SPECIALTIES CO., New York. —The use of highly refractory furnace cement will be demonstrated by means of a small, high temperature electric furnace and a new insulating brick which this company is placing on the market will be shown; represented by W. S. Quigley, W. C. Bell, L. G. McPhee and R. A. Wirfs.

RACINE TOOL AND MACHINE CO., Racine, Wis.—A line of high speed metal-cutting machines will be displayed, including two of an entirely new type; represented by J. M. Jones, F. J. Kidd, D. B. Maxwell and P. H. Graves.

REPUBLIC CREOSOTING CO., Chicago.—The wood block business of the Ayer & Lord Tie Co. recently was taken over by this company and its exhibit will consist of a floor laid with creosoted wood blocks and enlarged photographs showing plants in which these floors have been installed; represented by C. P. Reilly, L. H. Blythe, L. S. Eifel and B. S. McConnell.

RICHARDS-WILCOX MFG. CO., Aurora, Ill.—Overhead carrying truck equipment for conveying loads in foundries and industrial plants as well as several sizes of trolleys and I-beam trucks with switches, curves, trolleys, hoists, etc., will be shown; represented by A. J. Eggleston and E. J. G. Phillips.

RIVETT LATHE & GRINDER CO., Boston.—An extensive exhibit of machine tools will be made, including plain precision bench lathes, chasing bar lathe, back-geared precision lathe, mounted on an oak cabinet, internal grinders, a radial grinder, full automatic radial grinder and an improved thread tool; represented by A. F. Orcutt.

ROBESON PROCESS CO., New York.—Cores made with glutrin as a binder will be exhibited and photographs also will be shown of the use of this material in coremaking operations generally; represented by C. A. Rapallo, T. J. Ryan and T. J. O'Hara.

ROGERS, BROWN & CO., Cincinnati.—An unusual exhibit of various types of castings will be made, all

of which enter into government work and are used in the construction of ordnance, the building of ships, etc. Samples of pig iron of different grades also will be shown; represented by S. W. Hubbard, Thomas A. Wilson, J. C. Mears, A. O. Somme, A. D. Weaver, F. W. Bauer and J. R. Horehead.

ROTHACKER FILM MFG. CO., Chicago.

SCHROETER ENGINEERING CO., Chicago.—An electrically-operated sand sifter will be exhibited. This is a new machine which riddles the sand by a gyratory movement, the sand inside of the riddle being thrown by centrifugal force toward the rim. The machine is arranged for lamp socket connection and the motor is fully enclosed. The machine may easily be raised or lowered to suit the convenience of the operator; represented by J. Schroeter, W. Lindsay, S. Gimbel.

SHEPARD ELECTRIC CRANE & HOIST CO., Montour Falls, N. Y.—Owing to the fact that this company was unable to prepare any equipment for exhibition purposes, it had been decided to exhibit only large photographs of electric cranes and hoists for foundry use; represented by W. B. Briggs, R. H. McGredy and A. J. Barnes.

SHERIFFS MFG. CO., Milwaukee.—Propeller wheels manufactured by this company will be displayed; represented by Thomas W. Sheriffs.

SIMONDS MFG. CO., Fitchburg, Mass.—The extensive line of metal-cutting saws, files and hack-saw blades manufactured by this company will be exhibited; represented by H. B. McDonald and J. W. McLean.

SLY, W. W., CO., Cleveland.—A large horizontal sand-blast mill will be displayed and large photographs will be shown of installations of sand-blast equipment and other cleaning room machinery manufactured by this company; represented by W. C. Sly, G. J. Fanner, P. W. Graue, D. E. Hadley, R. F. Smith and E. J. Moore.

SMITH, R. P., & SONS, Chicago.—Safety shoes for molders and other employes of casting plants will be displayed; represented by J. B. Smith, Jr.

SMITH, WERNER G., CO., Cleveland.—The complete line of core oils manufactured by this company will be displayed and the exhibit also will be made of foundry supplies, including fire brick, plumbago and parting; represented by Werner G. Smith, M. S. Finley, F. H. Dodge, Wm. E. Ravel, L. P. Robinson, A. L. Fay, R. H. Mills and Theodore Bornhoeft.

SOUTHWORTH MACHINE CO., Portland, Me.—This exhibit will be made in connection with that of the Federal Machinery Sales Co., Chicago.

STANDARD OPTICAL CO., Geneva, N. Y.—A complete line of safety goggles for use in foundry and other industrial operations will be shown; represented by G. F. Dryburgh.

STANDARD SAND & MACHINE CO., Cleveland.—A core and facing sand mixer, direct motor-driven, will be shown in operation; represented by Harry E. Boughton and P. E. Lacey.

STERLING WHEELBARROW CO., Milwaukee.—A complete line of rolled steel foundry flasks and foundry wheelbarrows will be displayed. New types of reinforced flasks designed for extra heavy work and rough usage will be shown, as well as wheelbarrows equipped with springs for use in conveying cores; represented by I. R. Smith, H. H. Baker, J. J. Coyne, J. W. Dopp and E. W. Dowd.

STEVENS, FREDERIC B., Detroit.—An extensive line of foundry and plating shop equipment and supplies will be exhibited; represented by James F. Hughes and Henry Krigner.

STODDER, W. F., Syracuse, N. Y.—A cyclone suction sand-blast nozzle will be displayed; represented by W. F. and M. A. Stodder.

STRONG, KENNARD & NUTT CO., Cleveland.—This exhibit will consist of safety devices and first aid supplies, including goggles for chipping, welding and similar occupations, hospital furniture and supplies, molders' leggings and gloves, safety and danger signs, asbestos clothing, first aid cabinets, bulletin boards, respirators, sand-blast helmets and sanitary drinking fountains. A new non-shattering glass now used in goggles also will be demonstrated; represented by Buell W. Nutt.

SULLIVAN MACHINERY CO., Chicago.—This exhibit will consist of an angle, compound belt-driven air compressor with a rated capacity of 445 cubic feet per minute against a pressure of 100 pounds per feet per minute against a pressure of 100 pounds per square inch. This compressor will be operated against 80 pounds pressure to supply air for the different exhibitors having foundry machinery in operation. It will be driven by a 75-horsepower General Electric motor. This compressor is of the latest design built by this company and has incorporated in its construction plate valves which are used in both the high and low pressure cylinders for both the inlet and discharge of the air. Another feature of this compressor is the atmospheric relief valve with which the high pressure cylinder is equipped and by means of which air remaining in the high pressure cylinder and intercooler is unloaded to the atmosphere during periods when the compressor is running without load, under the action of the total closure inlet unloader. This unloading device reduces the horsepower required for operation by eliminating useless work. A single stage, belt-driven air compressor also will be displayed and photographs will be exhibited illustrating other types of air compressors, air lift pumps and similar equipmetn for installation in casting plants; represented by Joseph H. Brown, Howard T. Walsh, S. B. King, H. L. Bernard and Alex F. Milne.

SWAN & FINCH CO., New York.—Core oils and cores made with this company's liquid oil binder will be exhibited, together with high grade lubricating greases; represented by H. S. Chamberlin, William Sharp, J. A. Ellis, R. L. Babenroth, G. W. Hall, R. J. Kemp and Charles Howe.

TABOR MFG. CO., Philadelphia.—An 18-inch portable combination shockless jar-ramming, roll over and pattern-drawing molding machine will be exhibited and other types of molding equipment made by this company will be illustrated by photographs; represented by Wilfred Lewis, H. W. Brown, J. T. Ramsden, J. P. Fender, J. Degler, W. E. Sewell, D. J. Martin, J. H. Coleman, H. W. Impey, G. L. Sumner, E. S. Lewis, Philip Shire and E. A. Platt.

SYRACUSE SANDER MFG. CO., Syracuse, N. Y.—Disc and spindle sanders for pattern shop use will be exhibited; represented by Edward Gordon.

THOMAS ELEVATOR CO., Chicago.—Two or three-jaw chucks will be shown in operation on motor-driven machine tools and several other styles of chucks also will be exhibited; represented by J. J. Moore, W. A. Barker, J. A. Wheeler and Harry Cadman.

TORCHWELD EQUIPMENT CO., Chicago.—Oxy-acetylene welding and cutting equipment and supplies will be shown, including welding, cutting, decarbonizing and lead-burning torches, regulators, hose, accessories, welding rods and fluxes, welding wire, etc. Some of the equipment will be operated and demonstrations will be made of cutting and welding metal; represented by C. J. Nyquist, W. A. Slack, Hal R. Fenstemaker and N. Davis.

UNITED COMPOUND CO., Buffalo.—The vent and pattern wax manufactured by this company will be exhibited and samples of cores vented with this wax will be displayed; represented by J. W. and W. F. Bradley.

UNITED STATES GRAPHITE CO., Saginaw, Mich.—Samples of the large assortment of foundry facing manufactured by this company will be displayed; represented by J. G. Drought, E. S. Brownfield and C. H. Schenck, M. J. Houlihan and George D. Robinson.

U. S. MOLDING MACHINE CO., Cleveland.—The extensive line of molding machines to be exhibited by this company will be operated and will include a plain air jolt machine, jolt and squeeze machine, jolt squeeze pattern-drawing machine, jolt pattern-drawing machine and a jolt roll over pattern-drawing machine and a plain air squeezer; represented by J. N., J. L. and C. F. Battenfeld and R. W. Gramling.

UNITED STATES SILICA CO., Chicago.—Samples of sand-blast sand, steel molding sand, core sand, etc., will be exhibited and large photographs also will be on display showing the company's plant and manufacturing facilities. Samples of castings that have been sand-blasted with this abrasive also will be displayed; represented by A. Volney Foster, H. F. Goehig and Oliver Cook.

WADSWORTH CORE MACHINE & EQUIPMENT CO., Akron, O.—Coremaking machines and core room equipment will be displayed, including a motor-driven, self-contained coremaking machine, a core cutting-off coning machine, together with a complete line of steel reinforcing core and bottom plates. All of the machines exhibited will be operated; represented by G. H. Wadsworth and M. C. Sammons.

WALLACE, J. D., & CO., Chicago.—A bench planer and a bench saw adapted for pattern shops and woodworking plants will be displayed. The bench saw is portable and may be operated on an electric lighting circuit. The saw tilts instead of the table so that any angle cut can be taken. The motor is direct-connected and has sufficient power to cut through the hardest kind of wood taking a 2-inch cut; represented by J. D. Wallace, C. H. Landis, G. C. Taylor and H. L. Ramsay.

WANGELIN, WALTER H., & CO., St. Louis.—A calculator by which mixtures of iron may be rapidly figured will be exhibited; represented by Walter H. Wangelin.

WARNER & SWASEY CO., Cleveland.—The machine tools to be exhibited will be operated and will include a universal motor-driven turret screw machine and operating on chuck work and a universal hollow hexagon motor-driven turret lathe operating on bar work; represented by A. C. Cook, H. E. Whitam, C. E. Neubert.

WHEELER, F. H., MFG. CO., Chicago.—A complete line of protective wearing apparel will be shown, including asbestos, fireproof duck and leather leggings, gloves, mittens, spats, helmets, coats, pants, etc.; represented by F. H. Wheeler and E. L. Wheeler.

WESTERN ELECTRIC CO., New York.

WHITING FOUNDRY EQUIPMENT CO., Harvey, Ill.—Electrically-driven tumbling barrels, core ovens, worm-geared ladles, small air hoists, foundry trucks, turntables and other equipment for casting plants will be exhibited; represented by R. H. Bourne, P. A. Dratz, A. H. McDougall, H. P. Furlong and G. Schirmer.

WOODISON, E. J., CO., Detroit.—An etxensive line of molding machines wil be shown in operation, including and electrically-driven jar-ramming roll over pattern-drawing machine; air squeezer, coremaking machine for automobile cylinders, universal sensitive core machine, etc. Other equipment will include a grinder and a feature of this company's exhibit will be a reproduction of its plant made from cores in which this company's oil binder has been used. In addition, an extensive line of foundry, platers' and polishers' supplies also will be shown; represented by E. J. Woodison, C. H. Woodison, J. C. Woodison, C. D. Yahne, W. J. Wark, U. W. Frink, M. A. Bell, W. F. Haggman, R. S. Hoffman, G. A. Burman, J. F. Webb, William Maybank, William Muir, A. F. Jordan, W. W. Bowring, M. M. Werckman, F. F. Shortsleeves, J. M. Witters, H. S. Taylor and D. D. Baxter.

YOUNG BROTHERS CO., Detroit.—The front half of a core oven, 8 x 12 feet, will be shown and at one side will be exhibited electric heaters, automatic temperature control and a control panel. On the other side wall will be mounted a gas burner with an automatic temperature controller as well as recording thermometer. The construction in section of this company's unit sheet steel insulated panels will be demonstrated and the arrangement for firing ovens by oil or coke furnaces below the floor level will be displayed. Photographs, photostats and blueprints of conveyor types of ovens will be displayed; represented by George A. Young, R. B. Reed, C. C. Bradford, G. G. Parry, H. L. Ritts and John F. Robinson.

Systematizing Labor Management

Most Modern Methods for Dealing With Employe Relationship Problems Call for Central Department With Divisions Specializing in Employment, Welfare, Medical, Safety and Insurance Features

BY E. H. GOULD

THAT the problem of handling relations between the company and the employe in a large organization requires a specially-trained and organized staff is now universally conceded, but as few employers have taken up this subject and developed it in a scientific way one looking to find a correct criterion to follow will be disappointed, for there seems to be no two organizations developed along uniform methods. For the guidance of those who are interested in the best methods of organization and the apportioning of specific functions to subdivisions an outline has been prepared after extensive study of the most successful employment and welfare organizations.

The handling of employe relationship problems should be the function of a special department which should come directly under the president or the general head of the company, and this department should be managed by a special official who reports directly to the president. The functions of a modern department are: To engage, place, transfer and remove workmen; to provide for the safety of employes; to provide for the health of employes; to provide for the mental, physical and social welfare of employes, and to provide health, accident, death, and old age insurance.

Each of these five divisions requires the supervision of an executive who has the necessary technical education and practical experience, coupled with a pleasing personality. These five division heads should meet regularly in joint conference with the director of the department and should also meet with the heads of all the other departments of the plant to establish thorough understanding and co-operation.

Each of the five main divisions should be divided into clearly defined units that no phase of the work be neglected or favored. A tentative outline of the subdivisions follows:

Employment

Employment office engages new em-

The author of this paper, E. H. Gould, is associated with the industrial relations department of the Youngstown Sheet & Tube Co.

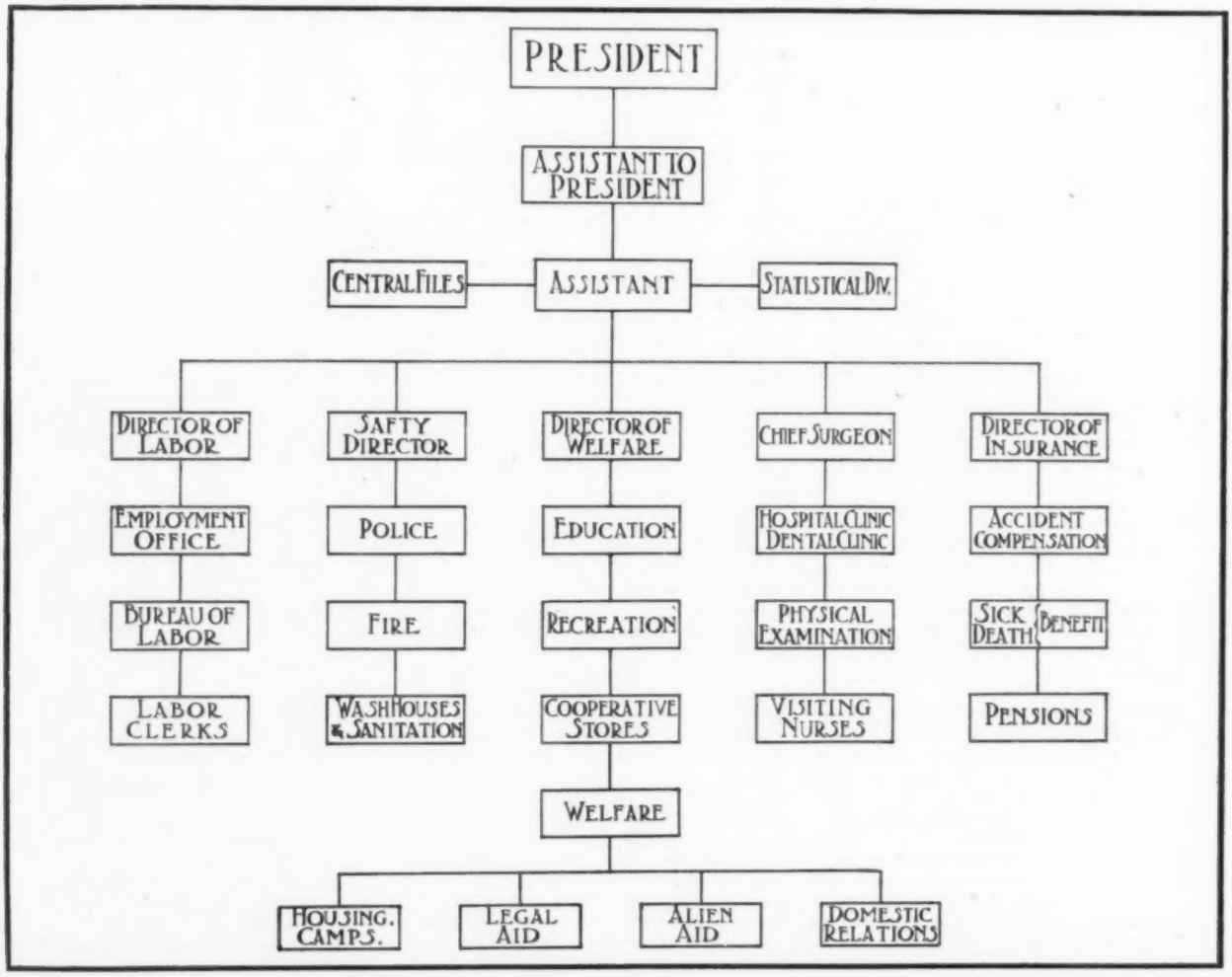


DIAGRAM OF HIGHLY-SPECIALIZED DEPARTMENT OF INDUSTRIAL RELATIONS, SHOWING HOW ITS VARIOUS OPERATIONS CENTER IN THE CHIEF EXECUTIVE OF THE ESTABLISHMENT

ployes, rehires and transfers old employes, and studies the jobs in the plant and the working conditions to place employes intelligently.

Registration office makes up the employment records of all employes engaged and assigns check numbers and clock cards to new employes.

Bureau of labor keeps daily records of the work and progress of employes in the various departments, investigates absentees at their homes to find out the reason for absence and to offer help in case of sickness or death, interviews all quitters and other employes who may be disgruntled or have labor troubles or complaints, to adjust differences when possible and passes on all discharges with final authority.

Safety Department

Provides safe working conditions.

Teaches and trains men to follow safe methods of work.

Investigates accidents and removes the cause when possible.

Provides for police and fire protection.

Provides wash and change houses, lockers, etc., and cares for their upkeep.

Medical Department

Provides first aid equipment and cares for injured and sick.

Provides for physical examinations of new employes.

Provides nurses to aid in the homes of the sick and injured.

Provides dental clinics for employes.

Sees that pure water is provided, and that good sanitation is maintained.

Instructs employes in personal hygiene.

Welfare Department

Educational division provides schooling for aliens and technical courses of instruction to train employes for better positions, provides a library for employes and publishes a factory newspaper the aim of which is to develop an *esprite d' corps.*

Suggestion committee stimulates the giving of suggestions by employes and provides proper rewards.

Recreation division organizes sports and athletics, provides and maintains playgrounds where employes live in congested neighborhoods and organizes and develops social amusements such as dances, corn roasts, picnics, field days, etc., for the benefit of the employes and their friends.

Welfare division helps the employe solve domestic and other personal troubles, teaches housekeeping and home hygiene in the home of employes, follows up the work of community agencies to protect the health, welfare and other interests of employes and their families, gives free legal aid and advice to employes and helps employes to get out of debt by obtaining the co-operation of creditors in preventing attachments, aids aliens to become citizens and to raise their standards and methods of living and operates a housing bureau to obtain houses and rooms for all employes.

Co-operative stores division organizes and operates a store for the benefit of employes.

Insurance Department

Handles accident cases and provides compensation in accordance with state laws.

Organizes sickness and death benefits under one of the following plans: Supported entirely by the company, supported jointly by the company and employe, supported entirely by employe.

Provides old age, service pensions and retirement pensions.

The work of all the departments should be made a matter of complete record and to facilitate this a statistical department should be operated. A central filing system should be used for keeping records of employes. Without adequate analytical records of the work done and results obtained much time and money could easily be wasted on useless enterprises. Unless the services rendered to employes develop a loyal, contented working force and stimulate wholehearted co-operation they are wasted.

Some of the known results from the adoption of the plan either in part or in whole have been a reduction in working time lost, a reduction in labor turnover, the elimination of serious labor disputes, the development of *esprite d' corps,* greater production, betterment of physical and social conditions of employes, a reduction of sickness and accidents, and the Americanization of alien employes.

Electric Heat as a Substitute For Gas

SUBSTITUTING electricity as a heating agent for natural gas, is a more complicated problem than the substitution of one fuel for another. In the case of fluid fuels the heating methods are more or less identical. These fuels are fed into the furnace after being mixed with air, and though the methods and the designs of the apparatus vary, there need be little modification of the furnace proper. Heat generation by the combustion of fuels takes place at high temperatures. Electrically-generated heat may be produced at any desired temperature up to the maximum amount obtainable from the arc.

The first question which arises in connection with the consideration of any substitution, is the one of cost. Gas is sold in thousand cubic foot quantities at a certain heat content per cubic foot. Electricity is sold in kilowatt-hour quantities at 3412 B.t.u. each. Figured out, electrically generated heat units are nearly 11 times as expensive as those produced by gas combustion. If the general average efficiency of a coal-fired, steam-driven, electric-generating plant is in the neighborhood of 0.083 per cent. and coal has a thermal value of 14,000 B.t.u. per pound, 1162 B.t.u. are obtained from each pound of coal burned. It is thus apparent that the utilization of the heat of combustion, directly as the heating agent, is more economical than to use electricity generated this way.

Electric heating equipment is not subject to flue-gas loss and may therefore be operated at a higher thermal efficiency. An electrically-heated steam generator can be made to give efficiencies as high as 95 per cent, while a high-temperature forge furnace may operate at 50 or 60 per cent. It is good practice to use expensive equipment, if thereby the total cost of the product can be materially lessened by increased production. Unusual conditions bringing about such results have developed in connection with many commercial applications of electricity to heating installations.

Arc welding is an application which has developed rapidly within the last few years. By means of the electric arc the operation of welding two pieces of metal together is more quickly done than when an ordinary flame is used. The saving in time, energy, labor and heat is enormous. It is undoubtedly much better from the point of fuel economy as well as financial economy, to repair an expensive broken casting by the expenditure of a little time and electrical energy, than to scrap it and spend a large amount of heat and labor

An abstract of a paper presented at the April meeting of the Engineers' Society of Western Pennsylvania. The author, Frank Thornton Jr., is heating engineer for the Westinghouse Electric & Mfg. Co., Pittsburgh.

to remelt and recast it. Another application of electric heating which has grown rapidly is that of japanning, enameling or other forms of industrial baking. The introduction of heat in this work has made possible more accurate control of temperatures, better distribution of the heat, greater safety, better regulation of the atmosphere, lower cost of production, greater efficiency of heat application and a better finished product.

Similar results were obtained with the application of electricity to hot-molding presses. For hot molding at temperatures above that obtainable from steam it had been customary to use gas. Electricity was tried and it was found that the uniformity of temperature regulation made possible a large saving in defective product which had formerly been caused by under and over baking. The value of the product thus saved was several times the cost of the electric energy consumed.

Use is Increasing

There are now numerous heating applications and the number is increasing rapidly which are being more economically, more safely and more satisfactorily solved by the use of electric heat. It is possible to satisfactorily design electric heating apparatus for any application requiring temperatures up to 932 degrees Fahr., and many operations requiring temperatures between 932 degrees Fahr. and 1650 degrees Fahr. are being successfully performed.

Although electricity has been dubbed "One of the babies in the family of the electrical industries," yet it is an exceedingly healthy and rapidly growing infant. Recently it was stated that there is no single generating station in the country that could supply power simultaneously for all the electric heating apparatus manufactured each year.

French Industry Ennobled for War Work

(*Special Correspondence*)

CITATIONS in the order of the day have been frequent in this greatest of wars. Encomiums have heaped upon auxiliary industries of all kinds, individuals have received honorable mention and honorary titles have been bestowed on many men for their participation in the fight for liberty.

But never before has the metallurgical industry of France received such praise as has been given publicity by M. Loucheur, minister of armament, in a letter to all French constructors of *materiel de guerre*. It cites an order of General Petain whereby the country is officially informed of the glorious role played by the French tanks in the last offensive, and refers to their builder, *Compagnie des Forges et Acieries de la Marine d'Homecourt*. The company has received the following letter:

> The assault cars which were manufactured by your company, and which our valient soldiers affectionately call the *Chars de St. Chamond*, have figured with great honor in our battles of 1917 and those of the spring and summer of 1918. I have already had the occasion of making

FRENCH ASSAULT CARS, CALLED BY THE BLUE DEVILS, CHARS DE CHAMOND, FOR THE DEVELOPMENT OF WHICH A FRENCH INDUSTRIAL PLANT WAS DECORATED

known to you my satisfaction of the services which you have already rendered the national defense. I am happy to give you this new acknowledgment of the talents of the engineers of your company through whose skill these *Chars de St. Chamond* were born, as well also of the devotion of your workmen who made their realization possible. As M. Clemenceau, the minister of war, has said: "All auxiliary industries should be proud of their association with the work of our admirable soldiers on the front.'

Compagnie des Forges et Acieries de la Marine d'Homecourt forms a part of the parent company of the *Acieries de St. Chamond* which dates back to 1850. It was this company that made the first 400-millimeter French shells which more than gave a sufficient answer to the 420-millimeter German shells which had been falling on Homecourt and Briey since the Germans first invaded the iron fields of French Lorraine.

For the moment St. Chamond is entirely a national defense plant, but its plans are already made for its after-the-war program which catalogs steel rails, locomotives, cars, springs, axles, rolling stock of all kinds, motor tractors, agricultural machinery, construction steel, sheets, bars, tool steel and machine tools.

Special Machine Faces Pipe Flanges

ONE of the problems brought about by present-day high-speed production in shipyards is the facing of high pressure copper pipe flanges as used in engine-room installations aboard vessels. The Newton Machine Tool Works, Inc., Philadelphia, has developed a special machine for this purpose which is shown in the accompanying illustration.

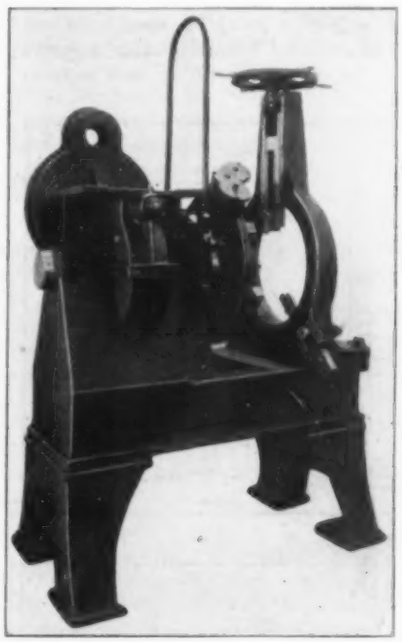
After the flange has been brazed to the pipe, the unit is securely clamped in the steady rest. This has three jaws, the two lower of which remain stationary after clamping in the desired position. These stationary jaws are graduated for quick setting. The third, or upper, jaw is actuated by a screw and hand wheel which affords means for rapid clamping. The jaws are equipped with swinging stops, the object of which is to locate the flange both square and plumb. The flange is brought against these stops and after the upper jaw is brought in position the stops are swung out of the way.

The facing tool is held in a tool post, the slide for which is fed through the medium of a star wheel which is rotated by a stationary stop. This principle has proved efficient in actuating tools that have a combined diametrical and rotary movement.

The spindle of this machine is of ample dimensions to insure freedom from chattering and is driven by a bronze worm wheel and a hardened steel worm. This drive is encased. The worm shaft is equipped with roller thrust bearings and the worm and worm wheel are oiled by continuous lubrication. The drive between the motor and the worm shaft is through spur gearing. The motor is mounted on the top of the machine base; but is not shown in the illustration.

The main castings of the machine are of ample section to insure stability and are ribbed where necessity requires. To provide a quick means for moving the machine from place to place in the coppersmith shop, a heavy bail is installed. Thus it is an easy matter to pick up the unit with a crane.

The machine has the following capacity dimensions: Diameter of spindle, 3½ inches; maximum diameter of flanges that can be faced, 20 inches; distance from center line of spindle to top of base, 15½ inches; length of star feed to tool post, 10 inches; length of in-and-out hand adjustment to tool post, 2 inches.



UNIT FOR FACING PIPE FLANGES

How Germans Looted An American Plant

How the Germans systematically looted the International Harvester Co.'s works at Croix, France, before war was declared between the United States and Germany, and how they finally dismantled the plant until little remains of the $3,000,000 property is told by Parke Randall, who recently returned to the company's Chicago office. Randall, who is an employe of the company, spent three years behind the German lines before he was ordered to leave. His story is as follows:

"When I left the fighting front was only five or six miles from Lille, the nearest city of size to our factory. Cannonading was incessant and we could hear the machine guns when the wind was from the right direction. I was one of the last Americans to leave the Lille district. When war broke out we had twenty-five Americans among our 1600 employes and most of these had families. Nearly all got away early.

"In the beginning the Germans professed to be friendly to us as an American concern. When the first looting of small articles was done by soldiers in December, 1914, I secured a paper from the German kommandatur at Roubaix declaring ours to be American property under the protection of the German authorities, and strictly forbidding requisitions. This guarded us from serious losses for three months when a large number of soldiers with teams broke the lumber yard lock and began loading up the lumber. They refused to recognize the kommandatur's certificate. As they left their captain fastened the gate with his own padlock and put up a sign saying the material was consigned by the fortieth Saxony infantry division.

"The Germans were hungry for copper from the beginning. I was repeatedly threatened with arrest because I would not sign a paper that was read to me in French to the effect that I did not know whether anything had been taken or destroyed, or if so, by whom. When it was learned at Lille in February, 1917, that America had severed diplomatic relations with Germany, the German war ministry took away our property on a wholesale basis for three months. Then suddenly they stopped looting

and tried to get me to agree to their taking our property, explaining they had received instructions to seize no American property without the consent of the owners. I refused, of course, and they looted worse than ever.

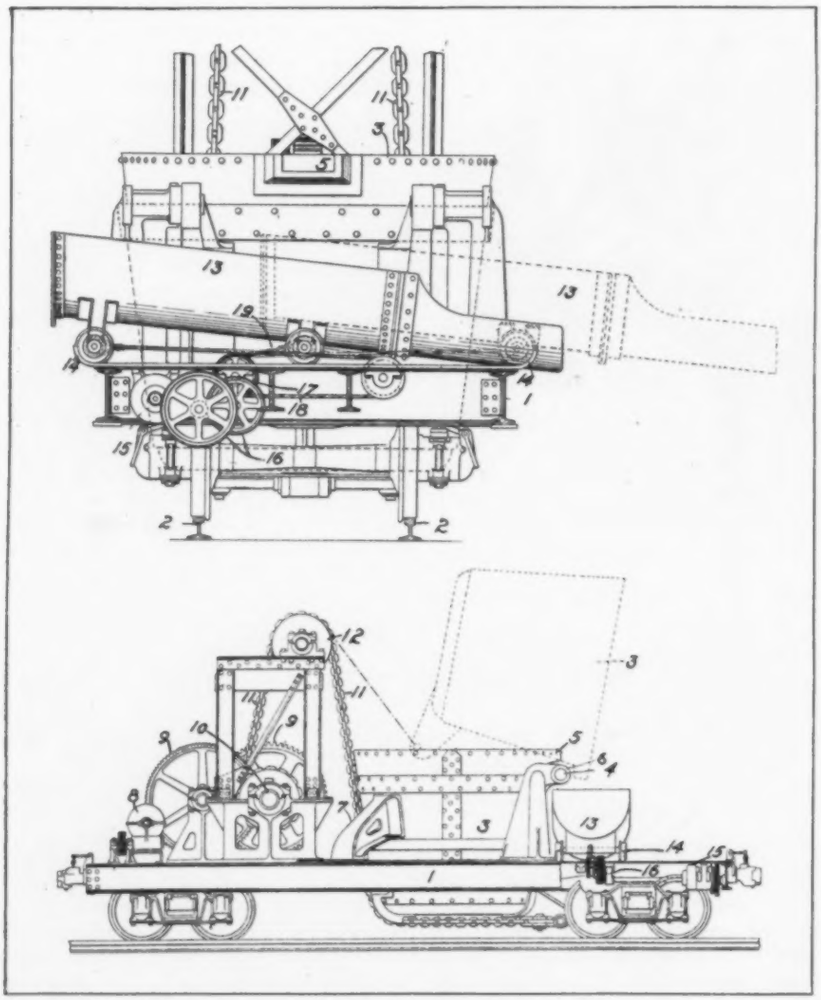
"My first application for permission to go home was refused. On Christmas I was told that I must get out immedidately and a German soldier marched me to the railway station on Dec. 31, escorting me to Conde, near the Belgium frontier. I was compelled to remain there two months so that any military information I might have would be of little use to the allies. I was not permitted to take out any written or printed matter, and so had to leave behind all the receipts I had secured for looted property, amounting probably to not less than $1,000,000 in value."

Molten Metal Charging Car

Compact Unit is Designed to Operate at a Minimum Labor Cost With a Low Metal Loss

TO provide an improved apparatus for transferring and charging molten metal into open-hearth furnaces the charging car shown in the accompanying illustration was recently patented by C. W. McClure and E. J. Reilly, Youngstown, O.

The device consists of a frame resembling in general appearance that of a flat car provided with two trucks so that it can be readily moved on a track laid in close juxtaposition to the charging door of the furnace with which the apparatus is to be used. On the car is mounted a pouring ladle provided with trunnions for tilting and a spout mounted for transverse movement. This spout receives metal from the ladle and transfers it to the furnace. Means are also provided for tilting the ladle and actuating the spout.



THIS INSTALLATION IS MOUNTED ON WHEELS AND TRAVELS ON A TRACK LAID BEFORE OPEN-HEARTH FURNACES

The body of the car is shown at *1* in the accompanying illustration. The car moves on the rails *2*. The ladle shown at *3* is provided with trunnions *4*. These are located near the pouring spout *5* and are mounted in bearings *6*. The ladle in its lowered position is also supported by the brackets *7*. The ladle is tilted by means of an electric motor *8* which drives a chain of reduction gearing *9* and a winding drum shaft *10*. The chain *11* is wound on this shaft passing over the idler *12*.

The spout *13* travels on a track *14* which is curved at either end to confine the movement. The spout is actuated by an electric motor *15* which is connected by a chain of reduction gearing *16* to a winding drum *17*. The cable *18* which is connected to the spout is wound up on this drum. To provide means for moving the spout in both directions another cable *19* is provided.

The operation of the device is simple. After the ladle receives a supply of molten metal, the car is moved to a position adjacent to the furnaces to be charged. The spout is then moved from its position shown by the full lines to that shown by the dotted lines in the accompanying illustration. When in this position, the delivery end of the spout is moved through the door of the furnace to be charged, the ladle tilted and the metal run into the furnace through the trough.

After the charging operation is complete, the motor that actuates the spout is reversed and set in operation, which brings the spout back to its normal position.

It is pointed out by the inventors that the entire operation is carried out without the use of a crane or a separate charging machine and that it can be made to serve a number of open-hearth furnaces built in line.

To eliminate loss of metal through splashing, the pouring lip of the ladle is located near the center line of the trunnions. This gives a short or low pour, the fall of metal being confined to the short drop between the pouring lip and the trough.

New Woodworking Drill

The Wisconsin Electric Co., Racine, Wis., has recently developed a drill especially adapted for woodworking. It has been used in airplane construction. The machine takes drills and countersinks with shanks up to 13/64 inch. The drill is of the high speed type and it is pointed out that ample power is provided to prevent stalling.

Priority in War Industry

Fifth Installment

Allocations

How They Are Made Their Priority Standing

Application of System Fully Shown

BY C. J. STARK

Editor, The Iron Trade Review

ALONG with priority another word which has gained prominence in the new business parlance of the war is allocation.

An allocation is an order for material which is given to the producer by those government officials who have to do with the supply of that particular material. This order is given in behalf of a user of the material who is fulfilling a contract for certain departments of the government but who has been unable on his own initiative to procure the necessary material within the time required. Those government departments for which allocations are made are the navy department, the war department, the Emergency Fleet corporation, the railroad administration, other government departments and certain designated agents of the government. It is intended that only material for work actually placed by these respective government departments, shall be allocated and this usually is done on the request of the particular department of the government which has placed the contract.

The distinction between allocation and priority is that an allocation is an order for material; a priority is a rating given to the purpose for which material already ordered is to be used and is to guide the producer of that material in giving precedence to the filling of orders on his books. It is to be noted that before priority occurs, the order must be placed.

Allocations primarily are confined to raw material rather than with manufactured articles. Allocations are made for both pig iron and steel and also for coal or coke, the latter in accordance with the preference list. No priority certificates are issued for pig iron; neither are they issued for coal or coke. Orders for steel products, however, in many cases are covered by priority certificates. In fact frequently it is found necessary to issue a priority certificate on a steel allocation to give it a higher rating than its character entitles it to automatically. It is conceivable that on a certain producer's books orders with identical priority rating and calling for the same kind of material may conflict in such a way as to retard the delivery of all or some. In such circumstances and in others of a similar exceptional character, a rerating of the orders may be made by the priorities committee. Provision is made that rerating to higher numbers may be given by the priorities committee whenever the need for such extraordinary action is shown.

For example, at the request of the navy department 10,000 tons of steel plates for destroyers are allocated by the division of steel supply to the Co-operative Steel Co. This order automatically takes an A-5 rating because of the provision that orders for the war and navy departments or for the Emergency Fleet corporation of a character entitling them to fall within Class A, automatically are given this suffix number. The Co-operative Steel Co. because of conflicting orders on its books may be unable to supply the tonnage of plates within the time desired for the work. The navy department then applies to the priorities committee for a priority certificate providing a higher classification stating the uses for which the steel plates involved are to be put. The priority committee may then issue a priority certificate against the Co-operative Steel Co. This certificate is forwarded to the plant which is to work up the plates to fill the order for destroyers. Upon this certificate then being served upon the Co-operative Steel Co. by the user needing the steel, the mill fills the order for the plates in accordance with the new priority number.

The primary function of the pig iron section of the division of steel supply of the war industries board is to procure pig iron for governmental orders.

The plan and procedure of the system is shown by following an allocation in pig iron through its various steps. Pig iron is handled by the director of steel supply of the war industries board, through the pig iron section of his division. A manufacturer having been given an order for certain material needed by one of the government departments requiring the use of pig iron, and feeling that the

Allocation Features

AN allocation is an order.

It usually is applied to basic materials for government orders where the demand exceeds the supply, such as iron and steel.

The difference between a priority and an allocation is that the former is a rating of the purpose for which an order is given; it, therefore, regulates the dispatch with which an order is filled. An allocation is one of the forms of orders to which priority is given. The purpose for which the allocation is made determines its priority rating.

Allocations of iron and steel are handled by the division of steel supply. All priority matters are in the hands of the priorities division in which are included the priorities board and the priorities committee.

tonnage of pig iron which he has in stock and on order is insufficient to enable him to complete his government work, applies to the department which placed the order or to the director of steel supply, for such additional quantity as will enable him to carry out his contract.

Should the application come to the director of steel supply, it is referred to the proper government department which has, or will secure through investigation the data necessary to enable it to make a request for an allocation of the amount of pig iron needed for the completion of the order. To determine the proper tonnage full information is secured as to the weight of the castings required to complete the contract; the amount of iron the manufacturer has in stock, in transit or on order; the analysis preferred; the usual source of supply; and the percentage of scrap normally used by the manufacturer.

This information is carefully considered by the government department which then makes a formal request of the director of steel supply for the tonnage of pig iron considered necessary, submitting with the request confirming data. The case is then carefully considered by the pig iron division which has in addition to the information submitted by the government department, data secured from the questionnaires returned by the producers, from personal interviews with various manufacturers, from investigation and from various other sources. All these facts are taken into account in arriving at a final decision. In certain cases it has been found that the manufacturer was not entitled to an allocation as he had sufficient iron on order and merely needed assistance in having it shipped. There have been cases where allocations were refused on the grounds that the manufacturer would be able to fill his contract from his own iron if he would conserve it by using a proper proportion of scrap in his mixture. In this connection it may be stated that aside from doing valuable work in conserving pig iron and properly distributing the available supply, the pig iron division is doing considerable educational work. This is accomplished by combatting many of the old rule-of-thumb methods of the foundries dating back to the days when iron was graded by fracture instead of analysis; and by showing the foundrymen that they can make changes in their practice. This later course includes increasing the amount of scrap used, eliminating the idea that four or five brands of iron are necessary to make up a mixture, discouraging the extravagant use of higher silicon iron, etc. It is pointed out that these methods will help the foundrymen to hold their organizations together and protect their invested capital, should it become necessary to reduce the supply of foundry iron.

The amount of pig iron required by the manufacturer under consideration having been determined, a regular allocation request form is made up by the pig iron division and is sent to the committee on pig iron ore and lake transportation of the American Iron & Steel institute with headquarters at Cleveland. The latter suggests the furnace or furnaces which are to furnish the tonnage.

It being the intent and endeavor of the director of steel supply to upset trade customs and usages as little as possible. On receipt of the allocation request the local committeemen of the district in which the manufacturer for which the iron is to be secured is located, makes every effort to place the order with the furnace which has usually served the user unless such an allocation would involve cross haulage or some similar circumstance. But should the furnace in question have so many allocations that it cannot accept further tonnage, the committeemen then endeavor to place the allocation at the furnace most conveniently situated to supply the manufacturer's needs. In such cases due consideration is paid to the various phases of the railroad situation, the rate of freight, similarity of the iron to that ordinarily used, time required for delivery and other conditions. There have been cases, however, when it was impossible to observe the conditions outlined as when the grade of iron needed could only be supplied from another district. In which case the question of supply has been considered paramount.

The furnace to receive the order having been determined, the director of steel supply is notified. After he authorizes the allocation, the manufacturer is advised either by the government department for the completion of whose order the iron is needed, or in certain cases where the pig iron section has requested the allocation, by the director of steel supply, that he may send his regular formal order to the designated furnace. The order calls for specified tonnages and grade of iron which is to be shipped at a prescribed rate. Accompanying this notification is an "authority" from the government department or the director of steel supply which serves to give the furnace assurance of the governmental validity of the manufacturer's order.

In cases where iron already ordered by the manufacturer is needed for the completion of government work, the director of steel supply instead of allocating, upon presentation of proof that the iron is required for governmental purposes writes the furnaces direct "ordering in" the iron. These instructions have all the weight of an allocation. Like an allocation, shipments under such instructions have preference over any other shipments even though every other order on the furnace books as developed by questionnaires supplied by the latter is shown to be for 100 per cent governmental purposes.

The allocation of steel products for government work is carried out in substantially the same way as in pig iron. No steel is allocated until it is established that the user needs the material for government work and cannot meet that requirement within the delivery time specified, either from supplies in his possession or from material under order with the mills. The government department makes the request for the allocation upon the steel director and the latter after due investigation, and if the need of the allocation is established calls upon the subcommittee on steel distribution of the American Iron & Steel institute to apportion the order among the mills. The subcommittee has its headquarters permanently in Washington and has established extensive facilities for the handling of its work. It cooperates in the closest manner with the steel director in making the actual allocation of the various orders and in following through the deliveries.

A-5 Priority is Applied to First Sub Contract

While no official announcement yet has been made, various steel companies have been advised through government scurces that a new ruling permits the application to the first subsidiary contract of the A-5 priority rating under Section 7 of Circular No. 4 issued by the priorities division. Under Section 7, contracts placed by the army and navy departments and by the Emergency Fleet corporation, automatically receive a A-5 rating. There has been a difference of interpretation of this clause as to how far the automatic rating extended to subsidiary contract. Some steel companies took the position that it could be applied to all subsidiary contracts entering into the principal contract similar to that under Section 8 of Circular No. 4. Most steel companies, however, have been acting on the belief that the automatic rating of A-5 could not be extended beyond the principal contract.

Labor Problems

Discussed at Employment Managers Convention at Cleveland

Ways and means of allaying the ever increasing shortage of labor, was the main topic of discussion at the sixth annual convention of the American Association of Public Employment Offices at the Hotel Hollenden, Cleveland, Sept. 19, 20 and 21. Members of the association from practically every state in the union were present, and plans were laid for concerted action in reducing the labor turnover to a minimum. The concentration of manpower to replace men in war industries who have been called to war, was also discussed.

Fred C. Croxton, labor director for the state of Ohio, delivered an address on "How to Organize a System of Employment Offices Within the State." The address was along the general lines of organization. He outlined a plan of concentrating the office forces of the respective labor bureaus which would be responsible to one man, who represented the federal government. He urged the adoption of a policy by employers of reporting the names of men who are discharged or quit their jobs to the labor boards in their communities. This policy, he pointed out, if carried out with the proper amount of interest, would keep the employment offices in touch with practically every laboring man in the country.

The public employment bureau, was termed a boon to the foreigner in an address by Prof. Don D. Lescohier, of the political economy department of the University of Wisconsin. Under former conditions, he stated, it was almost impossible for the foreigner to properly place himself in employment to which he was best suited, and was often the victim of unscrupulous employment agents, Mark M. Jones, of the Thomas A. Edison Industries, Orange, N. J., strongly urged the adoption by employment offices in assigning men to work, of methods used in the United States army for the classification of men as to trades and occupations. This system, he pointed out, reduces the classification of an individual to less than a 10-minute interview, resulting in the employment officer knowing exactly how well fitted a man is for a certain position. S. R. Rectanus, employment director of the American Rolling Mill Co., Middletown, O., called enthusiasm the most vital factor for keeping workmen constantly and actively employed. The question of standardized pay was touched upon in an address by Ralph G. Wells, of the E. L. du Pont, De Nemours & Co., Wilmington, Del. He stated, that the standardized wage, in his opinion, would do more than any one thing to solve the constant turnover of labor.

The convention closed with business meetings and the election of officers. Those elected were: John B. Densmore, director general of the United States employment service, Washington, president; C. B. Sexton, director of labor for the state of California, San Francisco, first vice president, and William Maxwell, Columbus, O., secretary-treasurer.

Government Plant

For Steelmaking in Queensland Urged By Broken Hill Proprietary Co.

Newcastle, N. S. W. Sept. 2.—The Queensland government is progressing with its plans for the establishment of an iron and steel plant and as a result of an investigation by a special royal commission it now appears that the government will undertake the enterprise. The government has been encouraged to proceed by the Broken Hill Proprietary Co., Newcastle, which has not only offered to sell the government the surplus ore which it does not require for its own steel works but has promised the co-operation of its experts in getting the government plant started.

The royal commission recently called on officials of the company at its Newcastle plant and questioned G. D. Delprat, the general manager. To the commission's surprise, Mr. Delprat, rather than discouraging the government enterprise as a possible competitor, urged the government to build a plant, which he estimated would cost approximately $5,000,000.

"My advice to you is to start straightway with the establishment of your steel works in Queensland," he said. "You do not need to wait to discover if you have sufficient iron ore in sight, because we have sufficient ore at Iron Knob to supply all our wants for many years and can supply you until you have found sufficient ore in your own state."

He said the company is taking 300,000 tons of ore annually from Iron Knob, the ore averaging 65 per cent of metallic iron. He urged the company to start with its enterprise immediately to obtain the benefit of high prices which are expected to prevail for some time after the war.

The company reports its production for the four weeks ending July 24 as follows: 10,865 tons of pig iron; 11,386 tons of steel ingots; 1935 tons of zinc concentrates and 1350 tons of lead concentrates.

$10,000,000 Order

Placed in Canada for Shells for U. S. —Dominion Plant Extended

TORONTO, Ont., Oct. 1.—What is regarded as the largest single order for munitions that has been placed in Canada by the United States government has just been awarded to the Canada Cement Co. The amount of the order exceeds $10,000,000 and is for the larger sized shells, which the company has been turning out for some time. The company will build a new shop and make other improvements to its plant to cost $1,000,000. If through any reason the order is not filled the agreement provides that the United States government will reimburse the company for capital expenditure on plant.

Extensive plans are now under way for the enlargement of the plant of the Dominion Steel Corp. According to Mark Workman, president, the extensions and improvements will cost $15,000,000. Although several years will be required to complete the work, some of the benefits will be derived as early as January. These plans include the plate mill, coke ovens and absorption plants for the manufacture of coal gas from by-products, such as benzol, toluol and sulphate of ammonia, and in addition extensions will be made to the iron mines at Wabana. The construction of the new plate mill is well under way, and it will be ready to furnish plates for Canadian shipbuilding before the end of 1919. The cost of this plant alone will be about $5,000,000. One of the newer products of the company is benzol, there being a heavy output.

In view of the shortage of pig iron and steel and the recent order in council issued at Ottawa giving the Canadian war trade board extensive powers in regard to the supervision of steel production, a conference of leading manufacturers in the province of Ontario was held here Sept. 18 at which the situation was fully discussed. It was pointed out that the domestic production of steel was limited owing to the small number of blast furnaces now in operation and it was decided to make an effort to have all available plants put in working order. A committee of three was appointed to wait on the war trade board and offer the co-operation of the consumers of pig iron and steel, with the object of bringing about increased production and a better distribution of materials.

The new board of directors of the Canadian Northern railway under the system of government ownership has been appointed.

Greater Output Government's Aim

Systematic Efforts to Speed Up Production Undertaken in Which All Interested Federal Agencies Are Actively Co-operating With Makers—Strive to Raise Pig Iron Yield to 42,000,000 Tons Annually

WASHINGTON, Oct. 1.—Unified and systematic efforts by the government to speed up iron and steel production to the limit of present capacity are taking form. This more aggressive policy is in harmony with the recent appreciation that has come to those in official authority that the government must assume a larger measure of responsibility in bringing this about. It is realized that the federal machinery directing the control of fuel, transportation, labor and other elements of production must be employed in a more co-ordinated way to supplement the efforts of the producers, if the obstacles opposed by present conditions to this desired end are to be overcome.

Seek 42,000,000 Tons Annually

Steel Director Replogle and his associates in the pig iron section, have declared that it is extremely desirous of getting the pig iron production of the country up to a basis of 42,000,000 tons annually. This means an increase of approximately 4,000,000 tons over the present rate of output which is running at about 38,000,000 tons for the calendar year.

In connection with the study of this problem, it is pointed out that although more furnaces are in blast at present than on any similar occasion in the modern history of the iron and steel industry, this output is far below that which should be effected from such capacity. On the last day of August, according to the statistics compiled by THE IRON TRADE REVIEW, 371 stacks were active. The August output was only 3,392,576 tons. This compares with 355 going stacks and 3,238,970 tons in August, 1917. The comparative July figures were 364 stacks and 3,408,584 tons for 1918 and 351 furnaces and 3,337,442 tons in 1917. The country's best year in war production was 1916 and the record month was October. In that month with 328 active stacks or 43 less than at the end of August of this year, 3,508,180 tons were produced or roughly 115,000 tons more than last month. In August, 1916, 317 stacks yielded 3,197,838 tons. Since October, 1916, probably 15 to 20 new modern furnaces have been put into commission, all capable of large production. The government is exerting its efforts to overcome the factors which have been making it impossible to get the full output warranted by the going capacity.

Director General of Railroads McAdoo has received a report showing that in the Pittsburgh district 130 furnaces out of 134 are in blast. This is the greatest number in operation at any one time since last December; in fact the greatest number in blast at any one time in this territory for many years. No furnaces in this territory are banked or out of blast for the lack of coke or other causes within the control of the railroads, while only four furnaces are out of blast for relining and repairs. On Feb. 7, in this district, there were only 82 furnaces in blast, while on the same date 38 furnaces were banked or out of blast for want of coke, 14 furnaces being out of blast for relining and repairs.

WEEKLY REPORT OF BLAST FURNACES- Week ending _____ 191
(To War Industries Board, J. L. Replogle, Director of Steel)

Name of Operater _____ Location _____

Number of Stacks _____ Stacks in blast _____

Capacity, all furnaces operating full under good conditions _____ tons per week.

Pig Iron produced last week. _____ gross tons.

THE PURPOSE OF THIS FORM IS TO SECURE INFORMATION WHICH WILL ENABLE US TO ASSIST YOU TO MAINTAIN YOUR FULL PRODUCTION

To do this we must have complete detailed information relative to all the causes which are cutting down your output. This means that you must give us ALL the data, as a simple statement of cause, without facts which make it possible for us to correct the trouble, is of no use.

1. If your trouble is with raw materials, state whether ore, coal, coke or limestone, and if coal what kind and for what purposes.
2. If your trouble is with labor shortage, etc., give details.
3. Please state if you produce your own ore, coal, coke or limestone, or receive from shippers, and whether By-Product or Bee Hive coke.
4. If your trouble is insufficient quantities of raw materials, or railroad delays on same, give names of shippers, routes, quantities, etc.
5. If your trouble is with quality of raw materials, give names of shippers, quantities, car numbers, dates of shipments and receipts, and in the case of fuel the approximate details of ash, sulphur or other impurities.

Signature _____

This sheet must be filled out and mailed to Washington EACH MONDAY whether your output is decreased or not, reporting conditions for the week ending the previous Saturday night.

FORM UPON WHICH BLAST FURNACES REPORT WEEKLY PRODUCTION.

Chrome Ore Prices Will Not Be Fixed

Washington, Oct. 1.—The war industries board will not at present fix a price on chrome ore. This is made clear in a telegram from H. W. Sanford, chief of the ferroalloy

section of the chemical division, war industries board, to F. J. Kestor, nineteenth regional advisor, at San Francisco. In the same telegram Mr. Sanford said the board expects the first half 1919 chromite output to be at a rate proportionate to that of 1918. The telegram follows:

"It is the present intention of the war industries board to arrange for continued chromite production in the United States for the first half of 1919 at a rate proportionate to the rate of 1918 production and the trade will be asked to purchase chromite of suitable grade produced in the United States during the first half of next year at this rate. No announcement can be made regarding prices. Believe tonnage domestic chromite of suitable grades produced balance this year can be sold at average prices advertised this summer by California Chrome Co."

United States Leader in Shipbuilding

WASHINGTON, Oct. 1.—The United States shipping board has just announced the latest authentic facts concerning shipbuilding in this country, stating, that as of Sept. 1, 1918, there were in the United States 203 shipyards and 1020 shipways, contemplating the construction of 2693 vessels of a total of 16,305,004 deadweight tons, or approximately 24,000,000 gross tons. Of the yards, 77 are steel, 117 wood, two composite and seven concrete, the number of ways being divided for 410 steel, 400 wood, composite and concrete, completed, with 63 steel and 54 wood, composite and concrete under construction.

The announcement discloses at present there are 2185 sea-going vessels under the control of the shipping board, aggregating 9,511,915 deadweight tons. Of these, 6,596,405 tons, or 1294 ships, are under the American flag. The total number includes 600 foreign ships of 1,707,099 tons chartered to American citizens, 449 requisitioned American ships of 2,900,525 tons, 377 American ships of 980,459 tons not yet requisitioned, 291 foreign vessels of 1,208,411 deadweight tons chartered by the shipping board, 256 new ships of 1,465,963 tons owned by the board, 100 former German and Austrian ships having a total of 644,713 tons, 81 Holland boats of 486,945 tons requisitioned, and 31 vessels transferred from the Great Lakes, with a total tonnage of 117,800.

The report of the shipping board says:

The American merchant marine is today expanding more rapidly than any other in the world. In August of this year the United States took rank as the leading shipbuilding nation in the world. It now has more shipyards, more shipways, more shipworkers, more ships under construction, and is building more ships every month than any other country, not excepting the United Kingdom, hitherto easily the first shipbuilding power. Prior to the war the United States stood a poor third among the shipbuilding nations.

Since August, 1917, more seagoing tonnage has been launched from American shipyards than was ever launched before in a similar period anywhere. The total, as of Sept. 1, 1918, 574 vessels, of 3,017,238 deadweight tons, is nearly four times all the seagoing tonnage (of over 1500 deadweight tons) built in the United States in any four prewar years. The total launchings since the first of this year, 482 vessels, of 2,392,692 deadweight tons, are more than eight times the seagoing tonnage (of over 1500 deadweight tons) produced in this country in any prewar year.

More than 2,000,000 deadweight tons of new ships have been completed and delivered to the shipping board during the past year. The first delivery was made on Aug. 30, 1917, by the Toledo Shipbuilding Co., of Toledo, O. The first million tons of completed ships were obtained in May; the second million in August. The deliveries to the shipping board in August broke all world's records in the production of ocean going tonnage and established the United States as the leading shipbuilding nation of the world. They totaled 349,783 deadweight tons. Those from American shipyards to the shipping board in August totaled 324,180 deadweight tons, exceeding the previous world's record for any month, which had been made by British shipyards in May, 1918, by 28,669 deadweight tons. The deliveries to the shipping board by American shipyards from Aug. 30, 1917, to and including Aug. 31, 1918, totaled 327 seagoing vessels of 1,952,675 deadweight tons. Adding eight vessels of 66,357 deadweight tons delivered by Japanese shipyards, the grand total of deliveries to the shipping board up to Sept. 1, 1918, was 335 vessels of 2,019,032 deadweight tons.

The shipping board has also contracted for the construction of 170 wood barges, 279 steel, wood, and congrete tugs, 100 trawlers, and 25 harbor oil barges, totaling 50,000 deadweight tons.

When the present shipping board began its work, in August, 1917, there were only 61 shipyards in the United States. There were 37 steel shipyards with 162 ways. About three-quarters of their capacity had been pre-empted by the naval construction program, while private orders overflowed the remaining ways. In the 24 wood shipyards there were only 73 ways.

The largest ship yards in the world in September, 1918, are those of the United States. The Clyde river, in Scotland, historically famous as the greatest of all ship building localities, is already surpassed by two ship building districts on the Atlantic coast and by two on the Pacific coast—by Delaware river and Newark bay in the east and by Oakland harbor and Puget sound in the west. One yard, Hog island, on the Delaware, is equipped to produce more tonnage annually than the prewar output of all the ship yards of the United Kingdom. It has 50 ways.

The records of the United States Shipping Board Emergency Fleet Corporation show that there are now approximately 386,000 employes in the shipyards. There were less than 50,000 shipworkers in July, 1916.

The weekly pay roll of the ship yards building ships for the United States shipping board is $10,500,000.

Two Associations Combine

At a meeting of the Interstate Pattern Manufacturers' association, representing an organization of patternmakers in Ohio, Indiana, Michigan and western Pennsylvania, and the National Association of Employers of Patternmakers, whose membership is largely in the East and New England it was decided to combine the efforts of both organizations and a new society was formed, known as the National Association of Pattern Makers.

This organization will include not only producers of patterns for the jobbing trade, but also pattern shops operated as departments of industrial plants. Firms or individuals, engaged in the manufacture of patterns, are eligible to membership. Sectional locals have been organized in various parts of the country which will hold membership in the national body. It was decided to hold the next annual convention in Buffalo, Aug. 16, 1919.

Officers were elected as follows: President, E. F. Ball, Newark Stamping & Foundry Co., Newark, O.; first vice president, Max A. Sills, Superior Pattern Works Co., Cleveland; second vice president, J. H. Bridge, Maumee Pattern Co., Toledo; treasurer, E. O. Melvin, Melvin Bros. Co., Columbus, and secretary, T. T. McGuire, Columbus. The following trustees were chosen: A. E. Schuchert, A. E. Schuchert Pattern Works, Cincinnati; S. H. Thompson Mfg. Co., Dayton, O., and Mr. Poole, Maumee Pattern Co., Toledo, O.

The Hendricks Manufacturing Co., First avenue south and Horton street, Seattle, is making preparations to install a 15-ton electric crane which will operate for a distance of 135 feet through its machine shop.

Output of Iron in England Reduced

Shortage of 36,000,000 Tons of Coal a Year Pinches Entire Industry—Influx of Americans in France Leads Authorities to Leave Workers in Essential Trades—New Scrap Iron Prices

Bureau of THE IRON TRADE REVIEW,
Prince's Chambers, Corporation St.,
Birmingham, Eng., Sept. 9.

THE shortage of coal has reached the stage where the production of pig iron has been reduced. Few furnaces are working at full capacity and the demand for more pig iron is constantly increasing. It is now common for a furnace to begin a shift with only a few hours' fuel supply, an experience hitherto limited to times of national strike. Expected supplies do not always come in time and the furnace has to go on slack blast.

Cleveland, which for the past few months has received more coal than the Midlands, is now about on an equal footing, as the furnaces find it impossible to keep up deliveries on the allotments made at the beginning of the month. One hundred and seventy thousand miners in Yorkshire laid off for a couple of days this week and this will have an effect on the Cleveland furnaces as well as on those of Derbyshire and Northamptonshire. The coal shortage also is affecting consumption of pig iron, many forges and foundries being unable to operate at full capacity.

Cleveland shipments are small, chiefly because of the scarcity of tonnage. Hematite is almost wholly absorbed by home requirements so that shipments are practically negligible.

It is not yet clear why the increase of 2/6 (60c) per ton was allowed on special irons, but a remarkable proportion of iron is now coming under the description of "special," the idea being that if makers can guarantee that the sulphur content comes below the specified limit they can claim the 2/6. Possibly, the ministry of munitions expects to get its return for the extra allowance in through greater production of good-quality iron. The reduction of make in Cleveland will have an immediate effect on the Midlands, as a fair supply of iron has been coming here to make up for the shortage of Midland brands

New Prices on Scrap Iron

A new order affecting cast iron scrap has in view the supplementing of supplies of raw material. Cast iron scrap has been hitherto excluded from the orders of July 7, 1916 and Oct. 31, 1916, so that while wrought scrap has been controlled, cast iron material has been the subject of comparatively free negotiation. The ministry orders the sale of all such material, whenever required, to the controller of salvage and stores, who has power to decide whether the material is scrap. The new schedule of prices is as follows:

Heavy ordinary cast iron scrap broken into pieces over 150 pounds each, but not exceeding 1000 pounds each, £4 15s ($22.80).

Heavy machinery cast iron scrap broken into pieces over 150 pounds each, but not exceeding 1000 pounds each, £5 ($24).

Cold blast cast iron scrap broken into pieces over 150 pounds each, but not exceeding 1000 pounds each, £6 15s ($32.40).

Ingot mold scrap, unbroken, £6 ($28.80).

Ingot mold scrap broken into pieces over 500 pounds, but not exceeding two tons each, £6 5s ($29.50).

Ingot mold scrap broken into pieces over 150 pounds each, but not exceeding 500 pounds each, £6 10s ($31.20).

Extra for breaking any of the above into pieces not exceeding 150 pounds each, 5s (70c).

Cast iron railway chairs, whole or broken, sold for remelting, £5 ($24).

Heavy cast iron lumps not exceeding two tons each, £4 12s 6d ($22.20).

Light cast iron scrap, £4 5s ($19.90).

Burnt cast iron scrap, broken ready for cupola, £3 10s ($16.80).

Burnt cast iron fire bars, £4 ($19.20).

Cast iron turnings and borings sold for use in the manufacture of iron and steel, £3 5s ($15.60).

To all the above prices a sum not exceeding 2½ per cent of such prices may be added in the case of sales by recognized scrap merchants. With the exception of the prices of cast iron railway chairs and cast iron turnings and borings, a sum not exceeding 10s ($2.40) per ton to cover inward carriage and handling may be added by recognized scrap merchants in the case of sales from yards used as scrap yards on Aug. 20. All the prices are free on rail or free in barge at the nearest convenient siding or wharf to the place where the scrap lies at the time of sale.

The general effect of these prices with the discount allowances will be to establish the present prices so that few readjustments of contracts will be necessary. The great object achieved is that further upward movement is arrested. An indication of the keenness for material is the probability that the pier at Ryhl, a popular Welsh watering place, which has been awaiting repair during the whole of the war period, will be dismantled and scrapped for war metal.

American Troops Need Sheets

The recent price changes in bars have been adopted with no appreciable effect on the volume of business. It is not a question of prices nowadays; consumers pay what they are called upon to pay and ask no questions. Orders for all kinds of material are plentiful. Sheets figure prominently in the list, chiefly for American soldiers in France. Prices still continue at about £17 ($81.60) for doubles. Several circumstances militate against full production. We have had a sultry period when few works have been able to make full time. Losses of two or three heats at puddling and mill furnaces have been common. The fuel scarcity is serious and compels late starts, Tuesday or Wednesday, instead of Monday. No doubt, as the result of the improved position in France, thanks mainly to the Americans, recruiting is not being carried on with quite such deadly earnestness as it was. The war department is not disposed to enroll men who can be of more service in civil life. It is increasingly evident that excessive zeal in enlistment has precipitated one of the most serious economic blunders of the war. The authorities were warned as to the consequences of withdrawing the last 25,000 men from the pits, and they are now getting them back again to work as quickly as possible. But the mischief has been done, and the coal controller reports a deficiency at the rate of 36,000,000 tons a year.

The bi-monthly return under the northern iron and steel board of conciliation and arbitration shows an average selling price for May and June last of £14 2s 8d ($67.84) compared with £14 1s 9d ($67.62) for the previous two months, the advance being insufficient to carry a rise in wages.

The plant formerly occupied by the W. S. Tyler Co., of Cleveland, at 2436 West Fifteenth street, Chicago, has been bought by the Sunbeam Chemical Co.

Obituaries

LEANDER J. HOOVER, president of the Hoover Steel Ball Co., Ann Arbor, Mich., died at his home in Ann Arbor, Sept. 23, following an illness of several weeks. Mr. Hoover was 42 years of age at the time of his death and numbered his friends among the strong personalities in manufacturing circles. While much of his time and energy during the past few years was devoted to the upbuilding of the steel ball industry, which bears his name, his activities in other lines covered a wide scope. In addition to being president and general manager of the Hoover Steel Ball Co., he was vice president of the Parker Mfg. Co.; president of the American Plug Co.; president of the King Trailer Co.; president of the Ever-Tite Nut Corp.; director of the Heath Carburetor Co.; vice president of the Mulkey Salt Co. and president of Forge Products Corp., as well as having financial interests in many other commercial enterprises.

Mr. Hoover attended public school in Cleveland, and when 13 years of age obtained a position at the plant of the Cleveland Machine Screw Co. He later became associated with the Grant Ball Co.; the Grant Hoover Co.; the Standard Roller Bearing Co.; the Flanders Mfg. Co. and finally founded the Hoover Steel Ball Co. in 1913. One of the striking and inspiring traits of Mr. Hoover's character was the deep interest he took toward the welfare of his employes.

Albert P. Weigel, president and general manager of the Weigel Machine Tool Co., Peru, Ind., died at the Miami county hospital, Sept. 16, following a four-weeks' illness of typhoid fever. Prior to locating in Peru about a year ago, Mr. Mr. Weigel was general manager of the Superior Machine Tool Co., Kokomo, Ind., for 11 years. For 10 years before that, he was superintendent of the Aurora Tool Works, Aurora, Ind. Mr. Weigel organized the Weigel Machine Tool Co., in Peru, about a year ago, at which time he was made manager and soon after the title of president was conferred upon him.

James C. Eastman, who made a fortune as an expert in steel, died at his home in Nashua, N. H., Sept. 4, aged 76 years.

James J. Reed, a British government inspector at the southside plant of the Jones & Laughlin Steel Co., Pittsburgh, dropped dead not far from the plant recently. He had finished work and was on his way home.

S. M. Rodgers, metallurgist of the American Steel & Wire Co., and one of the veterans of the operating staff of that company, died Sept. 17. Mr. Rodgers was born in 1860 near Wellsburg, W. Va. Following his graduation from Bethany college, he took a post-graduate course in science at the University of Michigan. He returned

S. M. ROGERS

to Bethany college as a teacher and in 1892 became chemist for the Hainsworth Steel Co., Pittsburgh. When that company was consolidated with the American Steel & Wire Co. Mr. Rodgers was appointed chief chemist of the Newburgh works of the American Steel & Wire Co., Cleveland. Later he was transferred to the Worcester, Mass. plant, where he served successively as chief chemist, superintendent of the open hearth department and superintendent of the north works. His next move was back to Pittsburgh as metallurgist of the company. Mr. Rogers was a member of the American Iron and Steel institute, the American Society for Testing Materials, the Society of Automotive Engineers and the American Institute of Mining Engineers.

George H. McCall, aged 48, who was affiliated with Russell & Co., Massillon, O., maker of agricultural implements, specializing in threshers and engines, for the past 30 years, died in Lakeside hospital, Cleveland, a few days ago. For the past 10 years he has been secretary and treasurer of the company, prior to which time he served as its collection manager. While he had been ill for some time, he was away from the office only a short while. Mr. McCall was a man of prominence in his field. He was high in Masonic circles.

Richard King, Allston, Mass., secretary of the Dodge-Haley Co., Boston, hardware and iron and steel, was killed in a railroad wreck in Dummerston, Vt., Sept. 10. For 25 years Mr. King had been connected with the company and he was both a traveling salesman and its secretary at the time of his death.

Spencer Merchant Maben, son of John C. Maben, president of the Sloss-Sheffield Steel & Iron Co., Birmingham, Ala., died at his home in Brooklyn, Sept. 26. Mr. Maben, who was 39 years of age, was a stock broker and floor trader in the New York stock exchange for Goaby & Co.

Addison M. Little, founder of James Little & Sons, now the Sailer-Whitmore Machine Co., Menasha, Wis., died Sept. 6 at the age of 84 years, after an illness of only two days. Mr. Little was born in New York, Oct. 1, 1836 and came west in 1845. He was one of the oldest pioneer machine-shop proprietors of Wisconsin and the Northwest.

Capt. Hilbert C. Wallber, of the 120th field artillery, thirty-second division, A. E. F., died in action during the recent American offensive. Before entering the service he was a member of the engineering staff of the Vilter Mfg. Co., Milwaukee. He was graduated from the University of Wisconsin as a mechanical engineer in 1910 and was 33 years old.

Thomas Mason, general superintendent of the New York Shipbuilding Co., who had charge of the building of the freighter TUCKAHOE, which was completed in the record time of 27 days, died Sept. 1, at his home in Camden, N. J. Director General C. M. Schwab, of the Emergency Fleet Corp., was so impressed with the ability of Mr. Mason, as reflected by his work on the TUCKAHOE, that he has presented him with a gold watch.

Men of Machinery Trade

Personal News of a Business Character Regarding the Men of Affairs of the Industry

ALVIN R. WHITEHEAD has resigned as secretary and purchasing agent of the George W. Clarke Co., Inc., Singer building, New York, machine tool builder. He now is affiliated with the American Condenser & Engineering Corp., Plattsburgh, N. Y., in an important capacity. Mr. Whitehead has been prominent in the second-hand machinery field. He has entered the manufacturing end of the government to obtain its requirements of condensers, etc.

E. P. Cook has been made sales manager of the Fawcus Machine Co., Pittsburgh, succeeding W. C. Bates.

Herbert A. Burns has been made manager of the shell plant operated by the New Home Sewing Machine Co., Orange, Mass.

J. C. Axelson recently was promoted to the position of general manager of the Axelson Machine Co., Los Angeles, Cal.

Henry E. Lingwell was recently appointed chief engineer by the Pierce, Butler & Pierce Mfg. Corp., Eastwood, N. Y.

F. Rodney Pleasonton has been made general works manager of the Savage Arms Corp.'s plants at Utica, N. Y., Philadelphia and Sharon, Pa.

Everett W. Swartwout, formerly affiliated with the Nordberg Mfg. Co., Milwaukee, Wis., in its New York office, has been made manager of the company's Philadelphia office.

Richard D. Murphy, formerly employment manager for the Wyman-Gordon Co., Worcester, Mass., has enlisted to do Y. M. C. A. work overseas for one year.

Lewis A. Hastings, for the past 11 years in the drafting department of the Heald Machine Co., Worcester, Mass., has been made publicity manager for the company.

Albert B. Fritts, advertising manager of the Norton Co., Worcester, Mass., is chairman of the publicity committee for the fourth Liberty loan campaign in that city.

Emil R. Lochman, owner of the Lochman Machine Co., Milwaukee, has with William Mahew organized the Lochman-Mahew High Speed Propeller Co., of that city.

Charles Sea has started a consulting and designing engineering business at 161 Summer street, room 80, Boston, having resigned as mechanical engineer with the West & Dodge Co., that city.

Frederick H. Payne, vice president and general manager of the Greenfield Tap & Die Corp., Greenfield, Mass., is soon to enter the service as a major in the ordnance department of the army.

Justin Griess, vice president of the McMyler-Interstate Co., Bedford, O., crane builders, has been made a member of a committee to administer fuel service in the Cuyahoga county district east of the Cuyahoga river.

John Guyer, crane erector for the Shepard Electric Crane & Hoist Co., Montour Falls, N. Y., has sailed for France, where he will install 20 overhead electric cranes in the factory of Automobil Berliet, Lyons, France.

Edwin McIlvried, chief engineer of the Champion Machinery & Forging Co., Cleveland, has been appointed a member of a committee in that city which has charge of fuel conservation in Cuyahoga county.

W. D. Creider, president of the Saxon-Creider Machinery Co., Erie, Pa., has received a captain's commission in the procurement division of the auto truck department of the army.

Mark Oliver has bought the machine shop, owned by James Rowe at Harrison and Aberdeen streets, Chicago, and will operate it under the name of James Rowe, Inc.

Mitchell S. Little, president and treasurer of the M. S. Little Mfg. Co., Hartford, Conn., has been appointed to represent employers in the first Connecticut district on the community labor board of the United States employment service.

Ernest B. Talkes became master mechanic for the Inland Steel Co., Indiana Harbor, Ind., upon his resignation from a similar position with the Federal Furnace plant of the By-Product Coke Corp., South Chicago, Ill.

H. J. Griffin, who has been in charge of the Pittsburgh office of the Milwaukee Electric Crane & Mfg. Co. has been commissioned a captain in the ordnance department and is now located at Washington. Howard P. O'Neil temporarily is in charge of the Pittsburgh office.

E. P. Burrell, manager of the Warner & Swasey Co., Cleveland, has been appointed chairman of a committee in that city, which will survey the need for women in industry in the northern Ohio districts and work out training schools to fit them to take the places of male workers.

Frederick R. Banks has resigned as assistant equipment engineer of the Remington Arms Union Metallic Cartridge Co. Inc., Bridgeport, Conn., to become chief engineer with the McNab & Harlin Mfg. Co., Paterson, N. J.

Roger P. Redier will, early this fall, take up headquarters in Paris, France, as general sales manager for the Allied Machinery Co. of America. He has been spending considerable time in this country, visiting the company's plants.

William Stegeman has become affiliated with the sales department of the M. J. Walsh Machinery Co., 144 Sycamore street, Milwaukee. He recently resigned as works manager of the Stegeman Motor Car Co., now the Parker Motor Truck Co., Milwaukee.

B. H. Tripp, special Pacific coast representative of the Chicago Pneumatic Tool Co., Chicago, has succeeded M. W. Priseler as district manager of sales for the Pacific coast territory. His headquarters are at 627 Howard street, San Francisco. He also will have charge of the Los Angeles branch of this company.

John Wilson, veteran shipbuilder of Seattle, has taken over the plant of the National Steel Construction Co. on the Duwamish waterway, purchase having been made from Albert Kelly. It is the intention to engage in building steel tugs and ships up to 300 feet in length as well as manufacturing crank shafts and other steel equipment.

Men of the Iron Trade

Personal News of a Business Character Regarding the Men of Affairs of the Industry

B. F. BOURNE, president of the Bourne-Fuller Co., Cleveland, has been made active manager of the lake division of the Red Cross, comprising Ohio, Indiana and Kentucky, it is announced by Henry P. Davidson, chairman of the national war council. He succeeds James R. Garfield and has been prominent in all of Cleveland's war activities. He was chairman of the executive committee of the French war and exhibit and was active in the Red Cross and Y. M. C. A. drives last year.

E. C. Wells, vice president and general manager of the Platt Iron Works, Dayton, O., has had to undergo several minor operations in a Boston hospital, but is expected to return to Dayton about Oct. 1.

Lewis P. Smith, of the Philadelphia office of the Matthew Addy Co., Cincinnati, has joined the staff of J. C. McLauchlan, chief of the pig iron section of the steel division, war industries board, Washington, D. C.

Charles H. Williams, assistant superintendent of the Donora works of the American Steel & Wire Co., has resigned to accept a position with the Penn Seaboard Corp. at its Wilmington, Del., plant.

W. L. Woodrow has been elected president of the Old Dominion Steamship Co. to succeed H. B. Walker, who recently resigned after having accepted a position as federal manager, coastwise steamship lines, United States railroad administration.

Charles E. Beardsley, Waterbury, Conn., who recently resigned as manager of the west brass branch of the American Brass Co., Waterbury, Conn., is president of the new company formed when the Risden Tool & Machine Co., Naugatuck, Conn., purchased the Novelty Mfg. Co., Waterbury, to make brass goods.

George F. Smith, assistant superintendent of the 134-inch plate mills of the Cambria Steel Co., at Franklin, Pa., has tendered his resignation effective Oct. 1. Mr. Smith has accepted a position as superintendent of the plate mill department of the Schoenberger plant of the American Steel & Wire Co.

R. E. Bebb, president of the Central Steel Co. and the Massillon Rolling Mill Co., Massillon, O., has been made chairman of the newly-organized Stark county council of national defense, which is to conduct a housing survey immediately. H. H. Timken, chairman of the Timken-Detroit Axle Co., is vice chairman. H. M. Geiger, a director of both the Central Steel Co. and the Massillon Rolling Mill Co., is on the executive committee.

Carl P. Seyler, vice president of Hubbard & Co., Pittsburgh, and president of the Beal Brothers Tool Works, Chicago, heads interests which have secured control of the Bronzbraswyt Metals Co., Pittsburgh. Mr. Seyler succeeds T. D. Maloney as president of the company, while H. W. Herman, sales manager under the old management, becomes treasurer and general manager and Carl J. Seyler vice president and secretary under the new regime.

John F. Duffy, for several years the Pittsburgh representative of the Atlas Publishing Co., New York, on Oct. 1, will join the Pittsburgh organization of Walter-Wallingford & Co. in an executive and sales capacity. Mr. Duffy has a wide acquaintance among the iron and steel interests of the Pittsburgh territory and in the newspaper fraternity, as he was attached to the Pittsburgh office of the New York News Bureau for several years and later on the editorial staff of the *Pittsburgh Press*.

W. C. Bird, who formerly was chief clerk of the American Steel & Wire Co.'s Waukegan works, Waukegan, Ill., has been transferred to the auditor's office in Cleveland and C. M. Diehl, formerly chief clerk at the Donora, Pa., wire works, succeeds him at Waukegan. D. M. Stinson, formerly chief clerk at the Allentown, Pa., works succeeds Mr. Diehl and J. B. McClure, formerly general clerk in the accounting department of the Donora wire works, succeeds Mr. Stinson at Allentown.

C. E. Crowther, blast furnace superintendent of the Republic Iron & Steel Co., Youngstown, has been made general superintendent of blast furnaces and open hearths, while W. E. Leventry, floor superintendent of the open hearth department, has been made superintendent of these furnaces, succeeding G. W. Peffer, resigned to become general manager of the Donner Steel Co. at Buffalo. The changes are effective Oct. 1.

Harry Cross, formerly Lake Erie manager of the Tomlinson fleet, and latterly in charge of the employment and welfare department of the Superior, Wis., plant of the American Shipbuilding Co., has resigned to become private secretary to G. A. Tomlinson, director of inland waterways transportation, with headquarters at Washington. Mr. Cross will be a commissioned officer in the army in this capacity. He made several attempts to enter the military service but was rejected for minor physical defects.

Christian Girl, president of the Standard Parts Co., Herbert J. Boggis, vice president of the Taylor & Boggis Foundry Co., H. B. Bole, vice president of the Hydraulic Pressed Steel Co., Charles W. Hotchkiss, manager of the Nationel Malleable Castings Co., George Bartol, president of the Otis Steel Co., Willard Fuller, works manager of the Upson Nut Co., H. S. Pickands, Pickands, Mather & Co., and A. W. Henn, secretary and treasurer of the National Acme Co., are among the 15 men selected to serve as the employers' advisory committee of the Cleveland employment service, under the new federal labor administration.

James W. Corrigan of the McKinney Steel Co., Cleveland, has offered his island summer home in the St. Lawrence river to the Canadian government for use as a convalescent hospital during the war. The site comprises 21 acres and the house can accommodate 100 persons. It is located on the New York side of the river near Waddington, N. Y., and Morrisburg, Ont. It is offered complete with all furnishings including linen. Mr. Corrigan made his offer to the United States government first but it was declined with the explanation that the island was too far from the nearest base hospital.

Iron and Steel Financial News

Up-to-the-Minute Fact and Comment Collected and Sifted For Busy Readers

New Loan Drive Starts With Whirl

BY far the most important current development in the financial world is, of course, the fourth Liberty loan campaign, which opened last week. Germany, in the past, usually planned her military campaigns so as to inaugurate her loan offerings with at least a secondary military success with which to whetten the enthusiasm of investors. Now, with the allied armies crashing down German resistance all along the west front, with Bulgaria asking for peace, with British troops victoriously gathering in the defeated Turks in Palestine, enthusiasm is on the increase here. Yet, in the matter of this $6,000,000,000 loan, the argument is rarely used that this may be the last war loan—an argument which Germany prematurely used on several occasions. As to the success of the new loan, there is no question in anyone's mind. Popular subscriptions will run higher than ever before for many millions of Americans have become educated to investment. Despite the increasing taxation, the wealthy will support this loan as heartily as previous ones. The task is not easy, but the loan campaign begins under the happiest auspices and its conclusion will be another answer to Burian and von Hertling.

Military Events Not Discounted

The stock market is so shut off from the credits which are needed for an old-time speculative movement that it has been unable to "discount" to any extent the recent important military developments. The market advanced gradually and deliberately over the past two weeks, without responding to the successes in Macedonia or Palestine, or to the progress of the allied armies in the west. This lethargy also probably was due partly to the fact that Wall street and investors have been interested principally in the new war loan.

The John Knape Machine Co., Grand Rapids, Mich., manufacturer of show case and cabinet hardware, has been succeeded by the Knape & Vogt Mfg. Co. The officers of this company follow: H. P. Belknap, president; J. J. Knape, vice president; and E. J. Vogt, treasurer and general manager.

American Ship Building Earns 79 Per Cent

Total earnings by the American Shipbuilding Co., of $16,206,662, after the deduction of manufacturing expenses, made the year ended June 30, 1918, the most prosperous year of the company's entire history. This compares with $4,866,011 for the preceding year. The net earnings after estimated taxes of $4,000,000, maintenance and all other charges was $6,626,266 equivalent to 79.91 per cent on the $7,600,000 common stock outstanding. The company paid 7 per cent on its preferred stock and 16¾ per cent on its common stock, after which the accumulated surplus was $9,947,829. The company's income account compared with the year previous follows:

	1918	1917
Gross earnings	$16,206,662	$4,866,011
Other income	860,529	751,973
Total	17,067,191	5,617,985
General expenses	1,931,640	424,309
General Taxes	207,924	150,110
Federal taxes	.....	122,307
Federal tax for calendar year of 1917 in excess of provision on June 30, 1917.	1,736,241	.....
Maintain., depree., int.	2,565,120	1,645,635
Special tax allowance	.....	400,000
Reserve for federal taxes	4,000,000	.....
Surplus	6,626,266	3,148,040

In his statement to stockholders President M. E. Farr of the company says in part:

During the fiscal year 45 cargo ships of 168,800 gross tons carrying capacity and two special steamships for the United States navy were delivered. The company has contracts with the Emergency Fleet corporation for 172 ships of 678,700 gross tons carrying capacity; between July 1, 1918 and Nov. 15, 1919. Construction is now well ahead of schedule.

During the year appropriations for plant extensions, equipment and improvements aggregating $6,125,657 were authorized and $4,781,992 expended. These additional facilities are for the purpose of assisting in carrying on the national program for ocean ships and are not necessary for the construction of ships for lake service. Such plant extensions for increased production during the present emergency may prove liabilities rather than assets.

The property of the company is free from encumbrances and there are no known contingent liabilities. The greater part of the profits for the year accrued from ship contracts with private interests. The policy of the company limits the profit on ships contracted for directly with any government department to an amount that is fair and equitable to the government and to the company.

The company's balance sheet shows that the total assets have grown from $33,661,242 one year ago to $60,230,769 as of June 30 last.

Moline Plow Co. is Bought by Willys-Overland Co.

Acquired by outright purchase, the Moline Plow Co., Moline, Ill., with its seven large plants, located in as many cities, is now controlled by the Willys-Overland Co., Toledo, O. The Moline company's output includes carriages, automobiles, plows, tractors, etc., and in announcing the deal, John N. Willys, said:

In the purchase of the Moline company I find not only an opportunity for Willys-Overland to lend its maximum manufacturing strength to war work but the best and quickest way to obtain a lead in a field which offers the greatest possibilities for the future.

The Moline Plow Co. now is capitalized at $30,000,000, was established in 1865 and incorporated in Illinois in 1870. Subsequently at various dates the company purchased a number of other plants engaged in the same or allied business. In 1912 the Adriance Platt Poughkeepsie & Co., was acquired, the payment being $1,500,000 in second preferred stock. Two years later the Chilled Plow branch was built and equipped near the Adriance plant.

The manufacture of automobiles was started in 1916 under the name of the Stephans Motor branch at

Freeport, Ill. The principal products manufactured by the company follow: Moline Plow Co., Moline, Ill., all kinds of agricultural implements, including tractors; Mandt Wagon branch, Stoughton, Wis., farm wagons, trucks, hay tools and scales, etc.; Henney Buggy branch, carriages, buggies and spring wagons; Stephans Motor branch; Monitor Drill branch, St. Louis Park, Minn., seeding machines; Adriance Plant branch, binders, mowers, rakes and plows; Acme Steel branch, Chicago, Acme soft center steel.

In 1917 the company earned net profits of $1,566,842. Mr. Willys said the Moline organization was to remain intact, with F. O. Allen, vice president and general manager, as president and general manager.

Half-Year Net is Large

Net earnings after dividends of the Chicago Pneumatic Tool Co., Chicago, for the six months ended June 30 aggregated $889,009, as compared with $911,438 for the full year of 1917. Only one quarterly dividend was paid, however, in the six months' period at the 6 per cent per annum rate, while 4 per cent was paid for the year 1917. Orders on hand are sufficient to cover the entire production of the company in various departments from four to six months. Shipments for first six months of 1918 were $5,179,318 which compares with $3,926,703, covering the first half of 1917. In spite of this the increased demand far exceeds the productive capacity. The demands from shipbuilders are particularly urgent.

Adds to Realty Holdings

The By-Products Coke Corp., Chicago, recently bought about 40 acres on Lake Calumet, adjoining its present holdings, giving a total of about 270 acres. The new acreage has a frontage of 1320 feet on Lake Calumet with full riparian rights. No plans have been made for improving this property, which is acquired simply to provide for future growth.

Earnings Are Reduced

Total earnings over expenses for the Taylor-Wharton Iron & Steel Co., High Bridge, N. J., for the quarter ended June 20 were $435,383 as compared with $430,457 for the March quarter. Reserves and contingencies reduced this figure to a balance of $179,871 against $188,073 for the March period. The bond interest of $53,125 and the preferred dividend of $33,250, the same for both quarters, left a surplus of $93,496 for the three months ended June 30 against $101,698 for the first quarter of the year.

Plans Are Formulated to Finance Utilities

Initial plans for the organization of the Essential Industries Finance Corp., have been announced in New York. Its purpose will be to aid in the financing of public utility companies and industries necessary for the successful conduct of the war. The company will be incorporated under the laws of New York state with a capital stock of $3,000,000, comprising $1,000,000 of stock, $1,800,000 of 10-year debentures and $200,000 surplus. It is planned that the capital stock shall be increased from time to time as the business of the company expands. Its capital will probably reach $20,000,000 ultimately, on which basis it will be able to borrow about $50,000,000 from the War Finance Corp., thus making available $70,000,000 for loans to public utility and other companies requiring financial assistance.

Of the $1,000,000 of present stock, $200,000 will consist of class A shares, which will be limited in respect to dividend returns, and $800,000 of class B shares, with no restrictions. The A stock will be sold at par while the B stock will be sold at $125 a share, the additional $25 a share providing the $200,000 surplus.

Eugene V. R. Thayer, president of the Chase National bank, will be president of the new corporation, and Frederick Strauss of J. & W. Seligman & Co. and Gerhard M. Dahl, vice president of the Chase National bank, will be vice presidents.

Builds Locomotive Cranes

Organized to build locomotive cranes, the American Crane & Engineering Co., Toledo, O., expects to have its product on the market about Jan. 1, 1919. Charles H. Tucker, who is head of the new company advises that he will retain his position as chief engineer of the Toledo Bridge & Crane Co., that city, builder of standard overhead traveling cranes.

To conduct a general machine business, including the development of new inventions, brasing and welding, and hardening and tempering steel tools, the American Machine Co., Hartford, Conn., has taken over the business of the Eldred Clark estate. The company is capitalized at $50,000. The officers are: President, G. E. Quinn; vice president and treasurer, F. D. Ellison, and secretary, R. H. Palmer.

Phenol Licenses

Issued By War Trade Board—Toluol Scarcity More Acute

New York, Sept. 28.—Licenses permitting the exportation of phenol which was manufactured before Aug. 20 have been issued by the war trade board. As a result, there has been an active scramble for such phenol and prices paid ranged from 44¼ to 45 cents per pound, material not suitable for export shipment may be quoted at 42 to 45 cents.

Coke Oven By-Products

	Spot
Per Gallon at Producers Plant	
Pure benzol	$0.22 to .27
Toluol (on sales sanctioned by government) (tank cars)	1.50
Toluol (on sales sanctioned by government) (drums)	1.55
Toluol (for government)	1.50
Solvent naphtha	no market
Per Pound at Producers Plant	
Phenol	$0.42 to .45
Naphthalin (nominal)	.12½ to .13
Per 100 Pounds at Seaboard	
Sulphate of ammonia (to fertilizer trade)	$4.50 to 4.75
Contract	
Pure benzol	nominal
Toluol	no market
Solvent naphtha	nominal
Per Pound at Producers Plant	
Phenol	nominal
Per 100 Pounds at Seaboard	
Sulphate of ammonia (for commercial use)	no market
Sulphate of ammonia (for government)	$4.50

The navy department has not yet released any solvent naphtha for commercial consumption, so that many users have not enough material to meet their requirements. Leading producers have undertaken to turn out a product which may be used as a substitute for solvent naphtha and it is expected that something along this line may be placed on the market shortly.

Fire at the Frankford, Pa., plant of the Barrett Co. recently, temporarily has halted the company's production of naphthalin and destroyed large quantities of this product. As a result, naphthalin again is more difficult to obtain and prices have responded. Around 12½ to 13 cents per pound now is being asked for spot. It is expected that the Barrett company will resume production in four or five weeks.

A good business continues to be done in benzol at 22 to 27 cents per gallon. Toluol is scarcer. The free quantity of sulphate of ammonia after government requirements, continues to increase. The commercial price is $4.50 to $4.75 per 100 pounds at tidewater.

Independents Incline to 8-Hour Day

Begin to Follow Lead of Steel Corporation in Adopting Rule Upheld by War Labor Board—Labor Shortage Expected to be Felt More Severely—Change Viewed as Great Wage Increase

INDEPENDENT steel manufacturers are giving serious consideration to the adoption of the basic 8-hour day in conformity with the action of the United States Steel Corp., and the beginning of what may develop into a wholesale movement in this direction already is apparent. Among the first of the independents to follow the lead of the corporation is the Jones & Laughlin Steel Co., which has announced that it will put into practice the 8-hour rule effective Oct. 1.

The situation at present is unsettled as to the general adoption of the 8-hour day, upheld recently by the war labor board, and its effect on wages and production. Two important elements enter into its consideration: If the 8-hour day is to be enforced, three shifts will be necessary and the shortage of labor will become more serious. If the actual working time is to exceed eight hours the adoption of the 8-hour day principle amounts to a general wage advance.

The argument that was put forth before the labor board's umpire in the Wheeling case, which led to the present movement, that the 8-hour day is most conducive to quantity production falls by the wayside, some manufacturers say, when it is considered that there are not enough men to make up three shifts for the essential industries. The solution of the problem is expected to be the ready consent of the men to work 10 or more hours a day to obtain extra pay. Not a few of the manufacturers consider the action of the board equivalent to awarding the country's workers increased wages under the label of an 8-hour day.

Virginia Producers Affected

Pig iron producers in Virginia declare that the literal enforcement of the 8-hour rule in their district would defeat the government's purpose to speed up production. The operators say they are working short-handed and it would be impossible for them to obtain a sufficient number of men to operate plants with three shifts. To them the adoption of an 8-hour would merely mean an increase of 50 per cent in the cost of labor. They claim the margin of profit at present is extremely narrow and the increase of $1 a ton in the government's price, effective Oct. 1, will not begin to offset the added outlay in wages. Shortage of labor has caused many furnaces to abandon the operation of their local ore mines and to rely almost entirely on lake ore.

The adoption of the 8-hour day would mean a big wage advance for all but tonnage men in the Mahoning valley, and for these, too, should there be a readjustment of tonnage wage rates.

On the usual basis of time and a half for overtime day labor rates would be advanced from 10 per cent to 16+ per cent, depending on the amount of overtime a laborer might work. At present day labor is paid $3.36 for eight hours, $4.20 for 10 hours and $5.04 for 12 hours. Time and a half would bring the pay to $4.62, or a 42-cent increase for 10 hours, and to $5.88 or an 84-cent boost for 12 hours.

Indications are that general adoption will mean a wage advance of about 10 per cent and correspondingly increase the cost of production more than $2 a ton on steel. Some concerns estimate the increase in cost will be $3.

Adoption of the basic 8-hour day automatically settles the demand of Youngstown district molders for the 8-hour day with time and one-half for overtime, now before the war labor board. The development came as a surprise to Youngstown manufacturers although the 8-hour day proposition has been agitated for some time. It is believed that its adoption may sidetrack the standardized wage movement.

Puddlers Lose Strike, and Defy Labor Board

Defiance of the war labor board is expressed in an authorized statement by an Amalgamated association leader at the Girard, O., plant of the A. M. Byers Co. Despite the recent decision of the board that the company is not required to recognize the association or sign its wage scale "since no such arrangements were in force prior to submission of this controversy to the board", the end of the disagreement has not yet been reached, according to this spokesman.

In accordance with the privilege of collective bargaining, he says, the association now plans to formulate and submit a wage scale to the company. Increased wages will be sought as "additional pay for preliminary work on the furnace, incident to charging", which, it is maintained, puddlers in eastern bar iron association mills are not required to do. No attention is paid to the fact that eastern association workmen are paid substantially lower wages than those in western association mills, or in mills paying the western association's scale, as is now being done in the Girard plant.

While this plant is paying the union scale and working under union conditions it refused to recognize the union and the association's leaders declared a strike which was terminated after 10 days on advice of the association's national officers. Eastern association workers recently submitted grievances to the war labor board, declaring they would strike unless they should be granted a wage scale similar to that of the western association.

Accidents Decrease

A decrease of more than 1000 cases of industrial accidents in Wisconsin is shown by a special report of the state industrial commission for the year ending June. 30. The number was 19,361, compared with 20,560 for the previous year. The amount of compensation showed an increase of about $150,000, due to the higher rates of compensation established by the state legislature of 1917. The average compensation paid per case was $81, compared with $69 for the previous period. The cost of medical attention per case was $27, compared with $23 in the year before.

The E. Ingraham Co., Bristol, Conn., has posted notices in its factory announcing a bonus of 10 per cent to all employes. The bonus will be paid monthly and will effect over 500 employes.

The federal industrial housing commission has let a contract for 174 houses to be built at Hammond, Ind., at a cost of about $500,000 for employes of the Standard Steel Car Co.

Machine Men Ignore Peace Whines

Determined That No Stalemate Shall Come on Western Front for Lack of Munitions, etc.—September Sees Great Activity in Industrial Sectors—Steady Stream of Supplies Flows Across Atlantic

INSTEAD of slackening their efforts to the tune of the peace whines originating in Germany, machine tool men with others in this country's industrial sector, are keeping pace with the onward march of Pershing's men. Recent allied achievements, particularly the all-American movements, have served to give an impetus to the production of shells, guns, ships, etc. It is the universal desire and effort to keep a steady stream of materials flowing across the Atlantic ocean to the American and allied forces. A disposition is noted on the part of the government to protect essential industries so they will not be crippled because of the drafting into military service of their skilled workmen. Machine tool builders, dealers, etc., are asked by Provost Marshall General Crowder to file claims for exemption for their essential employes. Another governmental suggestion has caused unusual activity during the past month and that is that plants producing essential work only will be able to obtain their required raw material, etc. Nonwar plants are gradually being converted to the production of work essential to the prosecution of the war. This is noted particularly among the pleasure automobile plants. These have been purchasing equipment to turn out trucks, trailers, tractors, tanks, shells, etc.

Gun Plants Take Many Tools

GUN plants in this country continue to tax the facilities of the machine-building plants. The large tools needed are not located in the used machinery markets. A large number of tools have been ordered by the ordnance department for the gun-relining plant in France, including giant gun-boring lathes, planers, grinders, etc. The Midvale Steel & Ordnance Co. placed orders for some tools but in all probability the biggest list in September came from the American Brake Shoe & Foundry Co., Erie, Pa., for about 150 various tools. The American Radiator Co., Bayonne, N. J., wanted a number of grinders among other tools for its gun plant. Gun mounts for 3-inch guns are being made by the Savage Arms Corp., Philadelphia, which entered the market for equipment. A revised list of the Neville Island ordnance plant's crane requirements was issued last week. It is estimated that between 150 and 200 cranes will be required. The original request for forty-eight 10-ton cranes has been superseded by one for a larger number and some 20 and 30-ton cranes are added. It is reported that some orders now are placed.

Shellmaking Plants Buy Extensively

FROM shellmaking plants came most of September's equipment business. Some plants already are fitted out to machine semisteel shells. These include Rathbone, Sard & Co., Foster, Merriam & Co., and the Michigan Stove Co., all of whom have been large buyers of machine tools. Approximately 33,000,000 semisteel shells of different caliber are to be ordered by the government and vast machinery needs are presaged. Dealers and builders await definite advice with interest. Eastern manufacturers were asked early in the month to entertain orders for about 120,000 75, 155 and 240-millimeter shells, which necessitated the purchase of some tools. Automobile plants in Ohio, Michigan and elsewhere are busily engaged turning out munitions. These include the Briscoe Motor Car Co., Jackson, Mich; Paige Motor Car Co., Detroit, and the Hudson Motor Car Co., Detroit, which is negotiating for equipment to produce two thousand 155-millimeter shells daily. Chicago dealers are said to have received an inquiry for 168 shellmaking machines for the Neville Island ordnance plant. The American Car & Foundry Co., St. Louis, Mo., has a contract for 155-millimeter shells and the Laclede Gas Light Co., that city, has built a plant to produce different sized shells. The Peters Cartridge Co., Cincinnati, has asked Cleveland dealers to figure on a fair sized list of tools and approximately $500,000 is to be expended by the Winchester Repeating Arms Co., New Haven, Conn. Cribben & Sexton, Chicago, stove manufacturers, purchased considerable shellmaking equipment and the International Harvester Corp. asked for 50 turret lathes for munition work.

Shipyard Equipment Demand Steady

OF vital importance to the carrying out of the war program, are ships. Without ships to transport shells, guns, etc., to France, every other effort is practically useless. Yards are fast reaching that stage of completion, however, where many ships are launched each month, but tool and equipment requirements steadily are maintained. The Bethlehem Shipbuilding Corp. figured among the largest buyers of cranes during the month, and it likewise purchased many tools. Overhead, gantry and wall cranes for Alameda and Sparrows Point were specified. Punching and shearing equipment was bought by the New York Shipbuilding Corp., Camden, N. J. The Federal Shipbuilding Co., the Newport News Shipbuilding & Dry Dock Co. and the American International Shipbuilding Corp., all closed for cranes.

Railroad Delays Are Costly

IT has developed that the system of ordering machine tools for railroads often entails so much delay that when the order finally is placed, prices have advanced and the order has to be returned and a new one issued. By the time this goes through, another advance perhaps has gone into effect. This was the experience of the New York Central recently and it is stated that the increased cost of tools purchased over the original estimates, has taken its appropriation so that expenditures must necessarily be curtailed. Perhaps the largest development during the month in railroad circles was the issuance of a tentative list by the Baldwin Locomotive Works, Philadelphia, covering equipment for its East Chicago plant. This is said to involve an expenditure of about $15,000,000 and calls for between 700 and 1000 tools. Regular weekly lists are issued by the Pennsylvania for its different shops. Requirements of the Columbus shops are heaviest. Other railroad inquiries and orders came from the Nickel Plate, Chicago, Milwaukee & St. Paul, Louisville & Nashville, Hocking Valley and Erie roads. It is understood that the department of military railroads has purchased all the equipment asked for France in its recent large list.

Tool Users Piecing Out Equipment

Buying in Small Lots to Bring Shops Up to 100 Per Cent War Work Efficiency—Big Lists Are Absent—Neville Island Crane Orders Reported Placed—Shipbuilders Continue Crane Buying

SINGLE machine tool inquiries and inquiries and orders for small lots characterize all markets for the past week. Users apparently are piecing out their equipment to bring their shops up to maximum operating efficiency on war work. The aggregate of this business and the business of a similar character transacted in recent weeks, surprises equipment dealers, since it is unmarked by any unusual or large lists. From St. Louis and other points west inquiries from car building shops reach the New York market. Unlike former inquiries of a similar nature, these were not preceeded by formal lists.

Railroad buying is perhaps as low as at any time in the past several weeks. In Chicago, railroad needs seem to be heavier than buying power, since many tools appear on successive lists. Buying this fall is not nearly as heavy as was foretold by the large lists issued last summer. Those contributing to orders booked by dealers are the Erie, Boston & Maine, Baltimore & Ohio, Nickel Plate, Pennsylvania, the latter continuing to inquire for shop equipment for Mingo Junction and Mosier, O.

Many projects in different sections presage further tool needs. These include a shell plant in New Jersey to be built by a Philadelphia company; an airplane assembling plant in Chicago, where also the Baldwin Locomotive Works plant remains in the air; another shell plant in Toledo, O., for which the ordnance department is negotiating for a building; as well as many contracts for war work including bayonets, semisteel shells, gun mounts and gun recoil mechanisms. A Newark, O., truck manufacturer is reported in the market for 80 lathes.

It is reported that the first of the crane requirements for Neville island ordnance plant have been placed. Shipbuilders continue to buy cranes whenever located. The Newport News Ship Building & Dry Dock Co., bought a number for Richmond, Va., from the Cleveland Crane & Engineering Co. The American International Shipbuilding Corp., bought several for Hog island and the William Cramp & Son Ship & Engine Building Co., Philadelphia, is inquiring for a number.

Western Car Builders Send Inquiries to the East

OUTSTANDING in the machine tool market of the past week has been a large volume of buying by car manufacturers, particularly by those in the St. Louis district. The effects of this demand have been far-reaching, a considerable amount of the equipment involved being bought in this market. This buying, however, was not preceded by a number of large formal lists. Railroad buying appears to have slowed up. During the past week a few tools were bought by the Erie, the Boston & Maine and the Baltimore & Ohio, but aside from this little was noted.

Eastern sellers continue to manifest much interest in the government's shell program, but developments so far have been coming along slowly. Reports of further pistol contracts being placed in the east are current. Perhaps the most interesting of these rumors is to the effect that a Philadelphia company is to start work shortly erecting a large shell plant in New Jersey. Trading in the eastern machinery market as a whole continues to be comprised of small lots, and new inquiry has failed to bring any large lists. At present, a few tools are being bought by the General Machine Co., York, Pa. The Babcock & Wilcox Co., New York City, has bought a small amount of punching and shearing equipment, and the General Electric Co., Schenectady, N. Y., is buying against a small list of miscellaneous tools. The Watervliet arsenal, Watervliet, N. Y., continues to buy equipment, including a small number of lathes. The ordnance department is figuring on a number of hydraulic presses. During the past couple of weeks practically all manufacturers of chucks have advanced their prices from 10 to 15 per cent. One manufacturer of milling machines and another maker, producing lathes, have boosted their quotations on next year's deliveries 10 per cent.

Included in the crane buying of the past week are three 30-ton gantry cranes for the new plant of the Newport News Ship Building & Drydock Co., at Richmond, Va. This business went to the Cleveland Crane & Engineering Co., Wickliffe, O., and makes a total of 10 gantry cranes to be placed with the Cleveland company for the Richmond plant. The American International Shipbuilding Corp., Hog Island, Pa., has bought four 10-ton overhead cranes from the Northern Engineering Works, Detroit, and two of the same size and type from the Champion Crane & Engineering Co. The Liberty Steel Products Co., Woolworth building, New York City, is inquiring for a 20-ton traveler. The William Cramp & Son Ship & Engine Building Co. is asking bids on one 40 and two 20-ton cranes, all with an 80-foot span. The Barber Asphalt Paving Co., Buffalo, want a 5-ton bucket handling crane, and the Consolidated Rolling Mills & Foundry Co., 25 Broad street, New York City, a 20-ton overhead crane.

Airplane Plant May Require Tools

BUYING of machine tool equipment in the Chicago district continues to be done in small lots and single tools. Most dealers are surprised at the volume of business they have done during September, as no features stand out to explain where all the business originated.

AGATHON Alloy STEELS

Our improved methods of steel production are the product of thought that clings to an ideal and clings and clings, until that ideal is thoroughly realized as it has been in Agathon Alloy Steel. Standard—for every conceivable purpose where a perfect steel must be used.

Insist on quality first.

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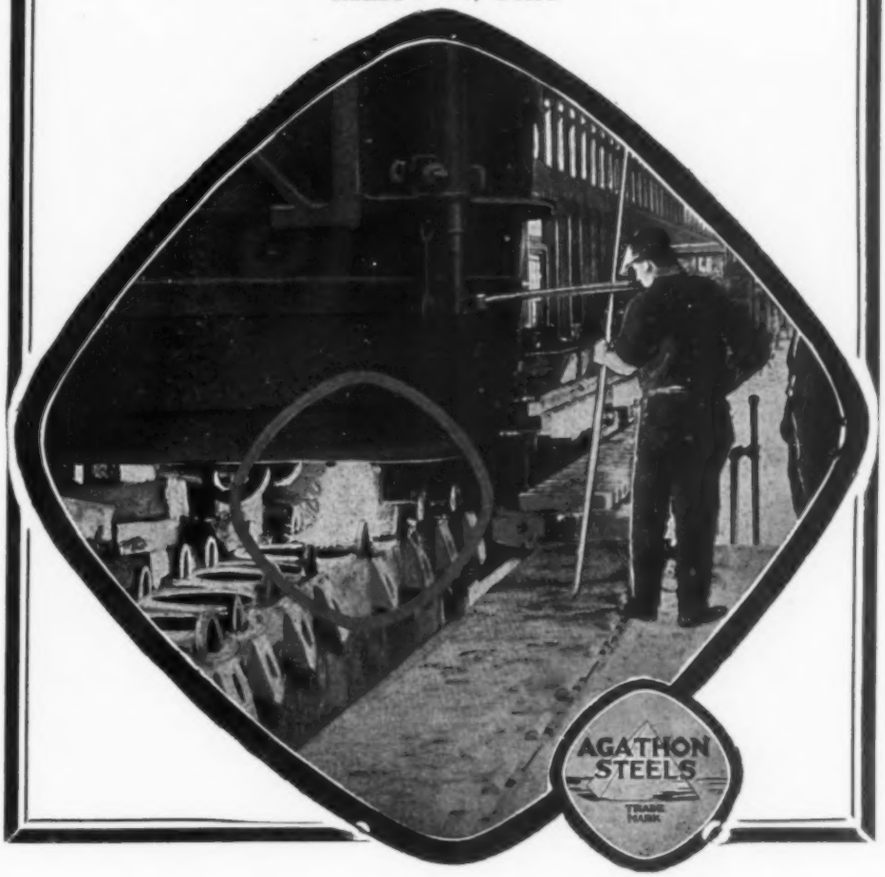


SALES OFFICES

Detroit Office
326-327-328 Ford Bldg., F. Walter Guibert, District Representative.

Cleveland Office
Hickox Bldg. The Hamill Hickox Company District Representatives.

Chicago Office
1370 People's Gas Bldg., 122 So. Michigan Blvd., C. H. Beach, District Sales Manager.

Philadelphia Office
603 Widener Bldg., Frank Wallace, District Sales Manager.

Syracuse Office
621 University Blk., T. B. Davies, District Sales Manager.

J. E. Dockendorff & Co.
20 Broad St., New York, General Export Agents.

AGATHON Chrome Nickel
AGATHON Chrome Vanadium
AGATHON Nickel Steel
AGATHON Special Analysis
AGATHON Vanadium
AGATHON Chrome Steel
AGATHON High Carbon

Railroads are not taking much equipment and lists sent out during the summer did not result in extensive fall buying. Apparently they need much more equipment than they are able to buy and some tools reappear in successive lists without being closed. As an instance, one road has inquired for a 100-inch planer in its last three lists and it is not bought yet.

Establishment of an airplane plant in Chicago under the auspices of the Illinois Manufacturers' association may result in some equipment being needed, but inasmuch as the new plant is to be an assembling proposition only, this may not amount to much. The new plant of the Baldwin Locomotive Works in the Calumet district is still in the air, apparently awaiting government approval. It is stated that the Studebaker Corp. recently closed on a list of about $500,000 worth of equipment which was subsequently cancelled without explanation. The Milwaukee Steel Foundry Co., Milwaukee, is building a foundry addition and will install a 3-ton electric furnace.

Truck Maker Wants 80 Lathes

OUTSIDE of an inquiry for approximately 80 lathes, Cleveland machine tool dealers are entertaining small lot inquiries and orders. It is stated that this item comes from a Newark, O., truck builder.

A large bayonet contract to be placed by the government continues to excite the interest of equipment dealers. This contract was figured upon by the Garford Mfg. Co., Elyria, O., but it now is understood that the contract will be placed elsewhere. Rumors of other war contracts to be placed in Cleveland point to large requirements of machine tools. These include gun recoil mechanisms, semisteel shells, tanks, etc. In this connection, dealers continue to manifest interest in the government's semisteel shell program. While many anticipate that this will necessitate the buying of much additional equipment, one prominent dealer states as his belief that the country's present machine shop facilities, diverted from other commercial lines, will be ample, particularly the machine shops operated formerly by automobile companies on pleasure cars.

Among the inquiries extant is one from the Standard Parts Co., Cleveland, for a 20-inch x 14-foot lathe; one from the Columbia Mfg. Co., Columbia, Pa., for a 12 or 16-spindle multiple drill press; and one from the General Fire Extinguisher Co., Warren, O., for a number of tools. It recently purchased the property of the American Linseed Oil Co., that city. The Emergency Fleet corporation recently purchased a lathe for a Cleveland firm.

Among the railroads, the buying movement is not showing much life. The New York Central continues to withhold orders. The Nickel Plate is reported to have closed on some of its requirements. The Pennsylvania issues inquiries for equipment for its shops at Mingo Junction and Mosier, O. For the former, it wants one 24-inch heavy duty upright drilling machine, one 6-foot arm radial universal drill press, one 24-inch x 4-foot centers engine lathe, one 36-inch x 11-foot centers, heavy duty engine lathe, and one 16-inch stroke heavy duty pillar shaper. For Mosier, O., this road requires one 24-inch heavy duty upright drilling machine, one 16-inch stroke heavy duty pillar shaper, one 36-inch x 11-foot centers heavy duty engine lathe, one 6-foot arm radial universal drill press, and one 24-inch x 4-foot centers engine lathe.

Work has commenced in earnest upon the tractor plant at Hamilton, O., by the Henry Ford Co. It has received permission to erect temporary power lines. The Mosler Safe Co., Hamilton, O., is erecting a new building to make gun carriages. The Erie railroad is building a roundhouse with coal trestle at Meadville, Pa. The Wapakoneta Machine Co., Wapakoneta, O., has begun an addition to its plant. A new tractor company has commenced operations at Miamisburg, O., Thomas G. Fox being head of the Fox Tractor Co. It is reported that Hoeven, Owens & Rentschler Co., Hamilton, O., is in the market for a number of tools for gun work. It recently purchased a giant planer from the Portage Lake Foundry & Machine Co., Ripley, Mich. This was built 20 years ago by the former Niles Tool Works, Hamilton.

Neville Island Cranes Placed

IT has been a rather uneventful week in machinery and machine tools in the Pittsburgh district, although it is understood that the United States Steel Corp. ordnance department has placed the first of the crane orders needed in connection with the gun plant on Neville island this company is constructing for the government. Nothing official has been given out; in fact, official information about Neville island requirements is carefully withheld. Report has it that this crane business went to an Alliance, O., builder. New lists of cranes for the Neville island plant are being put almost daily and it is reported that bids have been asked for coal handling machinery. Continued interest is noted in the probable machine tool requirements in connection with the 33,000,000 semisteel shells asked for the government.

New Construction and Equipment

Concise and Timely Business Building Opportunities from the Field of Industry

Among New England Factories

CORINNA, Me.—The Kenwood Woolen Mills is building a 2-story, 60 x 60-foot addition.

PITTSFIELD, ME.—The American Woolen Co., Boston, let the contract for a brick, 3-story addition to its mill.

LACONIA, N. H.—Plans have been drawn for a mill for Scott & Williams, Inc., New York.

NASHUA, N. H.—The Nashua Mfg. Co. has let the contract for a reinforced concrete, 5-story, 80 x 227-foot dye house building.

PORTSMOUTH, N. H.—Bids have closed for emergency hospital buildings for the government, to cost $75,000, at the United States naval hospital reservation.

BARRE, MASS.—The Charles G. Allen Co., iron founder and machinist, will rebuild its buildings recently damaged by fire.

BOSTON.—Bids have closed for the erection of a fireproof storehouse and castings shed for the Kinney Mfg. Co. on Washington street.

BOSTON.—The Electric Welding Co. of Boston,

WAR SAVINGS STAMPS

Inc., has been incorporated with $200,000 capital by Francis A. Lavelle, Johannes Kjekstad, Brooklyn, N. Y., and Gay Gleason.

BOSTON.—The Gillette Safety Razor Co. will start work at once on the construction of a $500,000 plant addition. The largest building to be erected will be eight stories, 74 x 167 feet.

BOSTON.—Bids have closed for a brick, mill construction, 1-story, 110 x 150-foot factory for the Eco Mfg. Co. If the project is permitted by the government the company will be in the market for motors, pulleys and belting.

CAMBRIDGE, MASS.—Rosenbaum Bros., metal goods, have let the contract for a brick, 2-story, 40 x 100-foot storage building and shop at Broadway and Sixth street.

CHELSEA, MASS.—Plans are being figured for hospital buildings, to cost $350,000, for the navy department.

HINGHAM, MASS.—Bids close Oct. 7 for a dispensary to cost $225,000 at the United States naval magazine.

LOWELL, MASS.—The Merrimack Woolen Corp. will build a 3-story, 63 x 70-foot addition.

LOWELL, MASS.—The U-Magnet Safety Razor Co. has been incorporated with $25,000 capital by Joseph A. Legare, Butler Ames and William J. Robinson.

LOWELL, MASS.—A $40,000 round house and repair shop will be erected here by the Boston & Maine railroad. The H. Wales Lines Co., Meridan, Conn., has the general contract.

SOUTHBRIDGE, MASS.—The American Optical Co. has let the contract for a reinforced concrete, fireproof, 2-story, 79 x 202-foot warehouse at its Lensdale works.

SPRINGFIELD, MASS.—The Nathan Kramer's Sons Co., Inc., has been incorporated to make metal goods with $15,000 capital by Michael Greenberg, Edward B. Kramer and Hyman Kramer.

SPRINGFIELD, MASS.—The general contract for the erection of a boiler house and hardening shop has been awarded by the Hendee Mfg. Co. to E. J. Pinney of this city.

WORCESTER, MASS.—The Wyman-Gordon Co. let the contract for a brick, 1-story, 60x180-foot storehouse and a 1-story, 40x80-foot addition to its 2-story testing laboratory building on Gold street.

NEWPORT, R. I.—Bids have closed for radio buildings, steel masts and towers, to cost $66,000, for the navy department at Melville and Coasters Harbor island.

ANSONIA, CONN.—The Ansonia Mfg. Co. let the contract for a mill construction, 1-story, 50x149-foot factory to cost $15,000.

HARTFORD, CONN.—The Hartford Special Machine Co. now is ready for revised bids on a plant addition, including a 40 x 55-foot warehouse.

PORTLAND, CONN.—The Portland Foundry Co., a subsidiary of the Baird Machine Co., Bridgeport, Conn., has purchased several acres of land from the Portland Mfg. Co., on which it will erect several buildings.

KILLINGLY, CONN.—The Brook Hill Mfg. Co. has been incorporated with $10,000 capital by John W. Patterson, L. S. Patterson and E. L. Darbie.

WATERBURY, CONN.—The Waterbury Buckel Co. will start work shortly on the erection of a factory building.

WINSTED, CONN.—The Winsted Gas Co. has increased its capital stock from $245,000 to $300,000 and contemplates improvements.

LUDLOW, VT.—The Jewell Brook Woolen Co. let the contract for a brick, mill construction, 1-story, 30x66-foot addition.

EAST PROVIDENCE, R. I.—An $18,000 addition will be erected to the plant of the Rumford Chemical Works. The proposed structure will be 1-story high, 50 x 252 feet, and will be built by William Merchant, Inc.

WARWICK, R. I.—The Rhode Island Malleable Iron Works has awarded a contract to C. W. Carlson, Providence, for a $35,000 plant addition. A foundry one story, 100 x 200 feet, will be included in the new work.

Along The Atlantic Coast

BROOKLYN, N. Y.—The Vulcan Rail Construction Co. will build a $10,000 warehouse, two stories high, 90x118 feet.

BUFFALO.—The Crosby Co. will build a sheet metal factory on Pratt street.

BUFFALO.—The McKennon Chain Co. will build an addition to its plant at Tonawanda, N. Y.

BUFFALO.—The Pierce-Arrow Motor Car Co. will build a steel boiler house to cost $60,000.

BUFFALO.—The Buffalo Airoplane Corp. is having plans drawn for a 1-story factory, 100 x 130.

BUFFALO.—J. P. Devine Co. of this city will build a factory on Clinton street.

BUFFALO.—The Prest-O-Lite Co., Indianapolis, will build four additions to its plant here.

BUFFALO, N. Y.—Bids now are being received by the Pierce-Arrow Motor Car Co. on four experimental shops.

BUFFALO.—The Auto Products Mfg. Co., 40 Elm street, is having plans prepared for a factory on Genesee street. A. E. Davenport is president.

BUFFALO.—The Lumen Bearing Co. has let the contract to the Schaff Co., Mutual Life building, for a foundry 60 x 100, to cost $16,000.

BUFFALO—Preliminary plans are being perfected by the United States Drawn Steel Co. for a plant addition. The J. W. Cowper Co. will be in charge of the construction.

BUFFALO.—A contract for the erection of a 1-story, 80 x 160-foot trimming building has been awarded by the Aluminum Castings Co. to the Schaaf Co.

BUFFALO.—The Monarch Knitting Co., Inc., will erect a 1-story, 30 x 54-foot boiler house and 1-story, 55 x 111-foot dye shop at its plant in this city. W. E. S. Dryer, Philadelphia, is engineer in charge of construction.

NEW YORK CITY.—The Hooper-Falkenau Engineering Co. has completed plans for a $20,000 foundry for the Lansdale Foundry Co., Downsdale, Pa. The proposed plant will be one story, 52 x 130 feet.

NEW YORK CITY.—The Wilson Welding Repair Co., 2 Rector street, recently incorporated with $50,000 capital, will build a repair shop in this city. D. H. Wilson heads the new company.

NEW YORK CITY.—The Amsterdam Building Co., 140 West Forty-second street, has received the general contract for building a warehouse and pier for the ordnance department at Sandy Hook.

NEW YORK CITY.—The Westinghouse, Church, Kerr & Co., 37 Wall street, are drawing preliminary plans for a 3-story, 200 x 600-foot extension to the plant of the General Chemical Co. in Baltimore. The proposed addition will cost approximately $200,000.

POUGHKEEPSIE, N. Y.—The Phoenix Horse Shoe Co. contemplates the erection of an addition to its plant.

POUGHKEEPSIE, N. Y.—Bids are being received by the Knickerbocker Motors Co. for the erection of a plant addition 60 x 180 feet.

ROCHESTER, N. Y.—The Eastman Kodak Co. is drawing plans for a 4-story factory building. C. K. Flint, of the Eastman Co., is engineer.

SHERBOURNE, N. Y.—The August Knitting Co. has postponed plans for erecting an addition to its mill here.

UTICA, N. Y.—The August Knitting Co. has let the contract for an addition 39 x 72 at this place.

ALLENTOWN, PA.—Contracts for an addition to the plant of the Trojan Powder Co. have been placed.

BATH, PA.—The Pennsylvania Cement Co. has let a contract for the erection of a storehouse here.

BEDFORD, PA.—The Tile Water Pipe Co. of this city will build a 3-story machine shop to cost $15,000.

BOYERS, PA.—The Ohio Valley Sand & Gravel Co. will build additions to its plant here soon. Walter K. Hamilton is manager.

CENTER HALL, PA.—The Leonard Construction Co. of this place has the contract for a government war factory in Mifflin county, near here.

CHAMBERSBURG, PA.—The Quigley-Hafer Co. has the contract for extensions to the round house of the Cumberland Valley railroad. This railroad also will enlarge its shops here.

ERIE, PA.—L. M. Mathias has taken out permits to build two additions, to cost $25,000 and $6000.

ERIE, PA.—The Erie Specialty Co. will build an addition 33 x 165 feet to its plant here.

ERIE, PA.—The Modern Tool Co. is having plans prepared for an addition to its plant to cost $20,000.

ERIE, PA.—The Triangle Tool Co. plans the erection of additions to its plant here.

ERIE, PA.—The Erie Specialty Co. will build an addition at West Twelfth street, 53 x 165 feet.

ERIE, PA.—The American Brake Shoe & Foundry Co. is letting contracts for new machinery.

ERIE, PA.—The Henry Shenk Co. of this city has the contract for plant for the Browning Folding Machine Co. at Nineteenth and Holland streets.

MARCUS POINT, PA.—The National Aniline & Chemical Co. has let the contract to the Austin Co., Cleveland, for the erection of a plant here.

McKEESPORT, PA.—The National Tube Co. has bought 47 acres of land at Dravosburg, Pa., and it is expected that a new plant will be built.

MEADVILLE, PA.—The Erie railroad has let the contract to the Watson Engineering Co., Cleveland, for terminals here to cost $500,000.

MEADVILLE, PA.—The government has closed a contract with the Watson Engineering Co., Cleveland, for the construction of a railroad terminal.

MERCER, PA.—The Mercer Gas & Water Co. will make important improvements to its plant here soon.

MONTROSE, PA.—The American Malleable Box Co. has started to remodel the foundry at Mill and High streets.

NEW CASTLE, PA.—The Standard Steel Car Co. has let the contract to C. F. Simmons & Co. of Pittsburgh for a plant on Mahoning avenue to cost $1,000,000.

PHILADELPHIA.—The Linde Air Products Co. has awarded contracts to the W. W. Lindsay Co., Inc., for the construction of plant additions.

PHILADELPHIA.—Contractors are estimating on plans for alterations and additions to the tool-hardening shop at the Frankford arsenal.

PHILADELPHIA.—Work has started on the erection of a 140 x 160-foot factory at Seventy-first street and Kingsessing avenue for the McFarlen-Mead Co.

PHILADELPHIA.—Stone & Webster, Boston, are drawing plans for a 1-story power plant, 380 x 400 feet. H. J. Strobel, 916 Chestnut street, Philadelphia, is in charge.

PHILADELPHIA.—Plans are being prepared by the

OHIO STEEL CASTINGS

If your work is such that you must have steel castings

True to Pattern
and
Absolutely Clean

and you would be interested in procuring castings with which you would have a

Minimum Machine Shop Loss,
give us a trial.

Our Springfield Plant is the best equipped and most modern in the country for production of steel castings up to 250 pounds.

The Ohio Steel Foundry Co.
Springfield, Ohio Lima, Ohio Bucyrus, Ohio

PLUS QUALITY HH SERVICE

navy department for the erection of a machinery and electrical shop at the Philadelphia navy yard.

PHILADELPHIA.—Bids soon will be taken by Major Hillis Hackendorf, Frankford arsenal, for the construction of a $200,000 carpenter shop.

PHILADELPHIA.—A $50,000 boiler house will be erected by the O'Meara Construction Co. for the Barrett Mfg. Co. The building will be 60 x 84 feet, one story.

PHILADELPHIA.—The contract for reconstruction of a plant building, recently damaged by fire, has been awarded to R. J. Whiteside & Sons by the Westmoreland Chemical Co.

PHILADELPHIA.—The J. G. Brill Co. will build a $75,000 reinforced concrete brick factory and storage building at its plant on Woodland avenue, and has awarded the general contract to Henry E. Baton. The proposed building will be 90 x 140 feet.

PHILADELPHIA.—The Pennsylvania railroad has awarded the general contract to Braun & Stuart for a $100,000 extension to its engine house No. 2, and the general contract for a $100,000 extension to engine house No. 4 to the Wm. Steele & Son Co.

PITTSBURG.—The Gibson, King Co. has the contract for a $5000 addition to the boiler plant for the Piso Co. on Neville island.

PITTSBURGH.—The Ward-Mackey Co. of this city has arranged to build a $125,000 plant on Penn avenue, near Lexington avenue.

PITTSBURGH.—Mayor E. V. Babcock has started a project to convert part of the Exposition building at the "Point" into a monster terminal freight trolley station for Pittsbugh.

PITTSBURGH.—The Keystone Resilient Wheel Co. has bought the plant of the Penn Enamel Sink Co. at Indiana, Pa., and will remodel it for its own use.

POTTSTOWN, PA.—The Light Foundry & Machine Co. has awarded a contract to Fred H. Keiser & Co. for the erection of a foundry, one story, 25 x 190 feet.

POTTSTOWN, PA.—North American Motors Co. will erect a $20,000 addition to its plant in this city. The proposed structure will be 1-story high, 80 x 90 feet. The Austin Co., Philadelphia, will be in charge of this work.

PUNXSUTAWNEY, PA.—The Eldred Glass Co. has started work on a plant here.

ROYERSFORD, PA.—The Buckwalter Stove Co. will build an addition to its plant soon.

ROYERSFORD, PA.—Adjoining property has been purchased by the Buckwalters Stove Co. for an addition to its plant.

SHARON, PA.—The Peter Iron Works Co. is arranging to build an addition to its plant.

SHARON, PA.—The Sharon Water Co. is in the market for considerable waterworks equipment, including a 5,000,000-gallon pump.

WARREN, PA.—The Pennsylvania railroad is making surveys preparatory to the enlargement of the Struthers station.

WILKESBARRE, PA.—Westinghouse, Church, Kerr & Co., 37 Wall street, New York City, are drawing plans for a power plant for the Vulcan Iron Works of this city.

WILLIAMSPORT, PA.—The West Branch Steel Co., 25 West Third street, has increased its capital from $100,000 to $300,000 and plans the erection of additions to its plant.

WRIGHTSVILLE, PA.—The Susquehanna Castings Co. has let the contract to D. P. Alston of this city for a factory on Walnut street.

YORK, PA.—The General Machine Works is having plans drawn for a $14,000 addition.

CAMDEN, N. J.—The New York Shipbuilding Co. has awarded a contract to the Hugh Lawn Construction Co., Boston, fo the reconstruction of the plate and angle shop, recently damaged by fire.

CAPE MAY, N. J.—The navy department is receiving estimates on plans for a $67,000 power house, to be erected here for the naval base.

NEWARK, N. J.—A 1-story, 100 x 185-foot warehouse will be erected by the Columbus Crystal Co. A. H. Barnett is engineer in charge.

NEWARK, N. J.—The Oxweld Acetylene Co., Chicago, has awarded a contract for an extension to the plant in this city to Frederick Kidgus, Inc.

NEWARK, N. J.—Work will be started soon on a manufacturing plant in this city for C. F. Massey & Co., Chicago. The proposed plant will be one story high, 40x150 and 70x216 feet.

PATERSON, N. J.—The Royal Hasco Co., Inc., will start work soon on the construction of a $22,000 addition to its dye works.

PERTH AMBOY, N. J.—A $90,000 extension will be made to the plant of the Standard Oil Co. in this city. The H. D. Best Co., 949 Broadway, New York City, will be in charge of the construction.

TRENTON, N. J.—The Jonathan Crucible Co. will start work shortly on repairs to its plant, which recently was damaged by fire.

BALTIMORE.—Walter E. Lee, city engineer, has plans for an addition to the city filtration plant here.

BALTIMORE.—The Baltimore & Ohio railroad has let a contract to Franie Bros. & Haigley for a machine shop, one story, 120 x 200 feet, to be erected in this city.

ALEXANDRIA, VA.—Plans are nearing completion for a torpedo assembling plant to be erected here for the navy department.

Central States Activities

BAYFIELD, WIS.—The Blackmarr Machine Co., Bayfield, Wis., which recently developed a power puller and piler machine, has booked orders for more than fifty machines in various capacities, and will enlarge its shops and working force to handle the contracts.

Government Inquiries

BIDS on the following equipment are desired by the navy department, bureau of supplies and accounts:

Machine tools, including saws, planers, saw tables and rip saws, 5780½, South Charleston.
Machine tools, including saws and grinders, 5878½, Hampton Roads.
One boring, milling and drilling machine, 5879½, submarine base, Connecticut.
One shaping machine, 5896½, Washington.
Two engine lathes and spares, shapers, drills, presses, grinders, forges and machinists' vises, 5899½, Boston.
Three trimming machines, 5900½, South Charleston.
Three tool grinding machines, 5908½, Washington.
Two boring, drilling and milling machines, 5910½, Mare Island.
Four motor-driven oilstone grinders, 5936½, Norfolk.
Machine tools, including lathes, grinders, drill presses, etc., 5943½, Brooklyn.
One engine lathe, 5951½, Brooklyn.
One milling machine, 5952½, Philadelphia.
Two gang drills, 5953½, Washington.
Three bench lathes, 5959½, Brooklyn.
One milling machine, 5981½, Brooklyn.
Machine tools, 6063½, Portsmouth.
One engine lathe, 6076½, Brooklyn.
Drills, 6082½, Brooklyn.
Machine tools of all kinds, 6083, Newport.
Three 42-inch Beckford regular, friction, backgeared, drills, two belt-driven, flat turret lathes, two horizontal boring, drilling and milling machines, one vertical spindle No. 3 milling machine, two duplex No. 3 milling machines, one vertical surface grinding machine, and two belt-driven, No. 12 profiling machines, 1940, Washington.
Two double head bolt cutters, one sensitive ball bearing bench drill, one 12-inch and one 14-inch floor drill, one 20-inch motor-driven, all geared, drilling and tapping machine, one 25-inch motor-driven vertical standard drill press, one 16-inch 8-spindle round head vertical multiple drill, one 30-inch motor-driven disc grinder, one 20-inch motor-driven wet grinder, three 2-inch portable pneumatic pipe bending machines, two 2-inch motor-driven pipe bending and cutting machines, two 2-inch motor-driven pipe threading and cutting machines, one motor-driven pipe threading and cutting machine, one No. 4 and one No. 5 arbor press and one motor-driven triplex pressure pump, 1939, Philadelphia.

Schedule numbers, dates of opening and places of delivery follow the specifications of the tools.

BIRON, WIS.—L. A. DeGuere, consulting engineer, Grand Rapids, Wis., has been engaged by the Consolidated Water Power & Paper Co. of that city to design and supervise the construction of a brick and steel paper mill and hydroelectric power plant addition at the Biron plant.

EDGERTON, WIS.—The Highway Trailer Co., James W. Menhall, is building an addition 40x200 feet.

EDGERTON, WIS.—The common council has awaded a contract to Lee Alder, Edgerton, for building a double-span steel bridge, with a 43-foot waterway, over Saunders creek at High street.

FOND DU LAC, WIS.—The board of public works will call for bids in a short time for the construction of a reinforced concrete and steel bridge over the Fond du Lac river at Bridge street.

MANITOWOC, WIS.—The common council has accepted the bid of The Rideout Co., Oshkosh, Wis., to furnish and install four steel safety gates at the approaches to the Eighth and Tenth street bridges.

MARINETTE, WIS.—The Northern Foundry Co. has purchased the plant and business of the Dost Pattern Co., Menominee, Mich., and is moving the equipment and machinery from Menominee to its main plant, now being enlarged.

MARSHFIELD, WIS.—Architects Childs & Smith, Chicago, are preparing plans for a $150,000 high school and industrial education building, the first unit of which will be two stories and basement, 50x125 feet. P. J. Kraus is secretary of the school board.

MENASHA, WIS.—The Gilbert Paper Co. awarded a contract to C. B. Meyer & Sons Co., Oshkosh, Wis., for the erection of a fireproof garage and service building, 35x80 feet.

MILWAUKEE—The Wisconsin Gun Co. will build a power plant to cost $180,000 and a structure duplicating its main building.

MILWAUKEE—The Koehring Machine Co. has increased its capitalization from $300,000 to $800,000 and will extend its manufacturing facilities. William J. Koehring is president.

MILWAUKEE, WIS.—A building permit has been granted to the Allen-Bradley Co., Greenfield avenue and Clinton street, for a 1-story fireproof addition, 64 x 90 feet, valued at $33,000. The company manufactures electric controlling devices, rheostats, etc.

MILWAUKEE.—David Lupton & Sons Co., Philadelphia, will furnish the steel sash and glazing for a new chipping and annealing building costing $100,000, for the National Brake & Electric Co., foot of Belleview place, Milwaukee.

MILWAUKEE.—The plant of the Northwestern Chemical Co., located at Sixty-first and State streets, Wauwatosa, Milwaukee county, was badly damaged by fire which followed an explosion of chemicals. The

building was 50 x 100 feet in size and three stories high. The loss is estimated at $50,000.

MILWAUKEE.—Paul Riesen & Sons, 1008 Humboldt avenue, has a contract to construct three mechanical coaling stations for the Chicago, Milwaukee & St. Paul railroad at Watertown Junction, Horicon and New Lisbon, Wis. The work is in charge of A. A. Wolf, union depot, Milwaukee.

MILWAUKEE—Architects Van Ryn & DeGelleke, Caswell block, are taking sealed bids until Oct. 3 for the erection of the first unit of the new Milwaukee Central Continuation school, at Seventh and Prairie streets. The unit will be six stories, 78x270 feet, of reinforced concrete, steel and brick.

MONROE, WIS.—The H. W. Johns-Manville Co., Milwaukee, has been awarded the contract for a refrigerating plant, steam piping and boiler covering required for the new $50,000 cold storage plant of the Owners' Industrial Co. Architects C. F. Ringer & Son, Milwaukee, are in charge. L. E. Gettle is secretary.

RACINE, WIS.—The Twin Disc Clutch Co. has been organized to manufacture clutches and other automobile parts. The company is capitalized at $100,000. Articles of incorporation were signed by Quarles, Spence & Quarles, Sentinel building.

WAUSAU, WIS.—The board of industrial education awarded following contracts for the erection of the first unit of the new central continuation school, costing $100,000: General contract, C. R. Meyer & Sons Co., Oshkosh, Wis.; reinforcing bars, Paul J. Kalman Co., Milwaukee and St. Paul; structural steel, A. F. Wagner Co., Milwaukee. Architects Swarthout & Speer, Wasau, are in charge.

WEST ALLIS, WIS.—The Pioneer Mfg. Co., 6703 Greenfield avenue, has increased its capitalization from $5000 to $25,000 and will add to its plant.

BAY CITY, MICH.—The Bay City Foundry & Machine Co. is building a 1-story foundry, 110x200 feet.

DETROIT—Richard Bros. Die Works, 364 Trombley avenue, will build a 1-story plant, 42x100 feet.

DETROIT—The Hoskins Mfg. Co., 256 Buchanan street, A. B. Tilton secretary, is building a 2-story plant, 60x180 feet.

DETROIT, MICH.—The Hoensheid Steel Treating Co., 805 West Fort street, will build a factory, to cost $30,000.

DETROIT—The Detroit Sheet Metal Works, Charles Lenman manager, 388 East Milwaukee avenue, is building a 1-story plant, 60x100 feet.

DETROIT—The Anderson Forge & Machine Co., F. A. Hinchman secretary, 2842 East Jefferson avenue, will build a 1-story boiler house, 65x100 feet.

DETROIT—The J. Brennan Co., C. F. Kingston manager, Twenty-fourth street and Michigan Central railroad, boiler manufacturer, will build an addition, 100x225 feet.

MONTAGUE, MICH.—The Montague Iron Works, M. M. Raymar general superintendent, will build a machine shop for the manufacture of marine engines.

CAIRO, ILL.—Sanderson & Porter, 72 West Adams street, Chicago, is planning to build a wrought iron plant to cost $1,500,000.

CHICAGO—The Gardiner Metal Co., 1356 West Lake street, is building a one and two-story plant, 40x220 feet.

CHICAGO—The Magnus Metal Co., W. H. Croft vice president, 4041 Emerald avenue, will build a 3-story factory, 50x100 feet.

CHICAGO—Foote Bros. Gear & Machine Co., J. B. Foote president, 214 North Carpenter street, is having plans prepared for a new plant.

CHICAGO—The Edison Electric Appliance Co., care W. G. Uffendell, architect, 39 South State street, is building a 1-story plant 100x146 feet.

CICERO, ILL.—The Lambert-Sievers Sheet Metal Works, capitalized at $25,000, has been chartered by Albert J. Lambert, Joseph Lambert and Albert Sievers.

EAST DECATUR, ILL.—The Staley Starch Mfg. Co. will build a 1-story machine shop, 50x240 feet.

HARVEY, ILL.—The Whiting Foundry Equipment Co., J. H. Whiting president, will build a 1-story foundry addition, 140x160 feet.

LA SALLE, ILL.—The Illinois Zinc Co. will build an addition.

LIMA LAKE, ILL.—The Lima Lake Drainage district, care Parkins Engineering Co., Quincy, Ill., will build two pumping stations.

SPRINGFIELD, ILL.—The McCann Mfg. Co. is having plans prepared for the erection of an addition and a foundry.

EAST CHICAGO, IND.—The General American Mfg. Co., capitalized at $200,000, has been chartered to manufacture railroad cars by Max Epstein, David Copeland, J. Horace Harding and Henry E. Butler.

INDIANAPOLIS—The Automatic Sprinkler Co., capitalized at $10,000, has been chartered by Louis Layton, Walter G. Glass and Thomas H. Sheehan.

INDIANAPOLIS—The Midwest Engine Co. will build two reinforced concrete and steel additions, 25x100 feet and 80x465 feet.

INDIANAPOLIS—The Specialty Gage & Tool Co., capitalized at $10,000, has been chartered to manufacture tools by John C. Ertel, Jr., M. Ertel and Edward E. Ertel.

MUNCIE, IND.—The I. W. Warner Co. will build a 1-story heat treating building, 38x200 feet.

NORTH VERNON, IND.—The Linkhart Mfg. Co., capitalized at $25,000, has been chartered to manufacture graders and separators by John W. Linkhart, Earl G. Linkhart and Ernest H. Lange.

BLACKLEY, KY.—G. D. Ison and others will build an electric light plant here.

CHARLESTON, W. VA.—The Diamond Ice & Coal Co. proposes to increase the capacity of its ice plant here.

CLARKSBURG, W. VA.—The Baltimore & Ohio railroad will build a roundhouse to cost $50,000.

FAIRMONT, W. VA.—The Monongahela Valley Traction Co. will build a byproduct gas plant here.

FAIRMONT, W. VA.—The plant of the Columbia Glass Co., recently damaged by fire, is to be rebuilt.

WEST UNION, W. VA.—The Carnegie Gas Co. has bought a pump station site near Greenwood and will begin the erection of the plant soon.

KANSAS CITY, MO.—The Midwest Wire & Iron Co. has suffered a loss of $10,000 by fire.

KANSAS CITY, MO.—The Talbot Reel & Mfg. Co. is building two additions, 55x125 and 70x130 feet.

ST. LOUIS—It has been recommended by B. F. Bush, director of railways, to the government, that improvements be made to the municipal bridge, including approaches and connections for railroads.

On The Pacific Coast

SEATTLE—The Brinkley Supply Co., 546 First avenue, will build a foundry.

SEATTLE—The Northwestern Motor Co., 600 East Pike street, is building a 1-story foundry, 100x200 feet.

SEATTLE—The Puget Sound Sheet Metal Works is having plans prepared for a 1-story plant, 90x200 feet.

SEATTLE—The Salmon Bay Foundry Co., 5320 Twenty-fourth avenue N. W., will build a foundry, 40x144 feet.

SEATTLE—C. L. Glasgow, of New York City, is building a plant, 41x175 feet, for the manufacture of welding appliances. J. R. Nevins, Hoge building, is the architect.

PORTLAND, ORE.—The Pacific Car & Foundry Co. is having plans prepared for a 1-story plate shop, 100x340 feet, and a crane runway.

PORTLAND, ORE.—The Smith & Watson Iron Works is about to build a 2-story foundry, 50x100 feet.

PORTLAND, ORE.—The McDougall-Overmire Co., capitalized at $150,000, has been chartered to engage in ship outfitting and repairing and to build marine boilers, water and oil tanks. C. C. Overmire is president and manager.

Business In Canada

CRAIGMONT, ONT.—The Coniagas Mines, Ltd., St. Catharines, Ont., will build a plant here for the retreatment of feldspar tailings. New equipment, including crushing machinery, power machinery, transmission equipment and building material will be purchased. F. D. Reid, Cobalt, Ont., is the engineer.

FORT WILLIAM, ONT.—Wayland & Carlin, Fort William and Winnipeg streets, will build a 2-story brick garage at a cost of $10,000.

GALT, ONT.—The city council plans the erection of an addition to its elcetric power plant to cost $25,000. Engineer W. H. Fairchild is in charge.

HAMILTON, ONT.—The Canadian Cartridge Co., Sherman avenue, has let a contract to the Pigott Healey Construction Co., 36 James street, for the erection of an addition to its plant to cost $40,000.

OTTAWA, ONT.—The Beach Foundry Co., Broad street, is having plans prepared for a foundry and an addition to its present plant to cost $75,000. Prices are sought on machinery and material.

TORONTO, ONT.—The British Acetones, Ltd., Mill street, will build an addition to its explosives plant, to cost $3000.

TORONTO, ONT.—The Ontario Fertilizer Co., Symes road, will build a plant addition to cost $10,000.

TORONTO, ONT.—The Hamilton Gear & Machine Co., 72 Van Horne street, has a permit for a plant addition to cost $38,000.

TORONTO, ONT.—George E. Gooderham has a permit and will commence at once on the erection of show rooms and a garage at Richmond and Sheppard streets, to cost $81,000.

CAP DE LA MADELEINE.—The Tidewater Shipbuilders, Ltd., propose to engage in the manufacture of boilers and marine engines and have let a contract to the Anglins, Ltd., 65 Victoria street, Montreal, Que., for the erection of a foundry and machine shop to cost $100,000.

Iron and Steel Prices

Corrected to Tuesday Noon

IRON ORE

Superior Ores, Per Ton, Lower Lake Ports	
Old range Bessemer, 55 iron	$6.65
Mesabi Bessemer, 55 iron	6.40
Old range non-Bess., 51½ iron	5.90
Mesabi non-Bess., 51½ iron	5.75

WAREHOUSE PRICES

Steel bars, Chicago	4.17c
Steel bars, Cleveland	4.07c
Steel bars, Detroit	4.13c
Steel bars, Philadelphia	4.13c
Steel bars, New York	4.145c
Steel bars, St. Louis	4.24c
Steel bars, Cincinnati	4.13c
Steel bars, St. Paul	4.395c
Steel bars, Buffalo	4.10c
Iron bars, Buffalo	4.70c
Iron bars, Chicago	4.77c
Iron bars, Cleveland	4.67c
Iron bars, Detroit	4.75c
Iron bars, St. Louis	4.84c
Iron bars, Cincinnati	4.13c
Iron bars, Philadelphia	4.73c
Iron bars, New York	4.745c
Shapes, Chicago	4.27c
Shapes, Detroit	4.23c
Shapes, St. Louis	4.34c
Shapes, St. Paul	4.495c
Shapes, New York	4.245c
Shapes, Cleveland	4.17c
Shapes, Philadelphia	4.23c
Shapes, Buffalo	4.20c
Shapes, Cincinnati	4.23c
Plates, Buffalo	4.45c
Plates, Chicago	4.52c
Plates, Detroit	4.48c
Plates, St. Louis	4.59c
Plates, St. Paul	4.745c
Plates, New York	4.495c
Plates, Cleveland	4.42c
Plates, Philadelphia	4.48c
Plates, Cincinnati	4.48c
No. 10 blue anl. sheets, Chicago	5.52c
No. 10 blue anl. sheets, Cleveland	5.42c
No. 10 blue anl., Buffalo	5.45c
No. 10 blue anl. sheets, St. L.	5.59c
No. 10 blue anl. sheets, Cincinnati	5.48c
No. 10 blue anl. sheets, St. Paul	5.745c
No. 10 blue anl. sheets, Detroit	5.48c
No. 28 black sheets, Chicago	6.52c
No. 28 black sheets, Cleveland	6.42c
No. 28 black sheets, Cincinnati	6.48c
No. 28 black, Detroit	6.48c
No. 28 black sheets, St. L.	6.59c
No. 28 black sheets, St. Paul	6.745c
No. 28 galv. sheets, Chicago	7.77c
No. 28 galv. sheets, Cleveland	7.67c
No. 28 galv. sheets, Cincinnati	7.73c
No. 28 galvanized, Detroit	7.73c
No. 28 galv. sheets, St. L.	7.84c
No. 28 galv. sheets, Buffalo	7.70c
Hoops, Cleveland	4.92c
Hoops, Detroit	4.98c
Hoops, Buffalo	4.95c
Cold rolled sheets, Buffalo	6.45c
Cold rolled steel	list and 10

IRON AND STEEL SCRAP

(Prices in Gross Tons)

STEEL WORKS USE

Bundled sheets, Cincinnati	$23.00 to 23.50
Bundled sheets, Pittsburgh	22.00
Bundled sheets, Cleveland	26.00 to 27.00
Bundled sheets, Buffalo	24.00 to 25.00
Boiler plate, cut, No. 1, Chicago	28.00 to 28.50
Boiler plate, cut, No. 1, St. Louis	26.50 to 27.00
Frogs, switches, guards, St. Louis	28.50 to 29.00
Frogs, switches, guards, Chicago	29.00
Heavy melting steel, Pittsburgh	29.00
Heavy melting steel, Buffalo	30.00
Heavy melting steel, Chicago	29.00
Heavy melting steel, Cleveland	29.00
Heavy melting steel, Cincinnati	28.00 to 28.50
Heavy melting steel, east. Pa.	28.00 to 29.00
Heavy melting steel, N. Y.	26.00
Heavy melting steel, St. L.	28.50 to 29.00
Heavy melting steel, Birmingham	27.00 to 28.00
Baled sheets, Cleveland	28.50 to 29.00
Baled sheets, Pittsburgh	26.00
Baled sheets, Chicago	29.00
Knuckles, couplers, Chicago	34.00
Knuckles, couplers, St. Louis	33.00 to 33.50
Low phos. steel, Buffalo	37.50
Low phos. steel, Pittsburgh	39.00
Low phos. crops, eastern Pa.	39.00
Low phos guaranteed E. Pa.	36.50
Shoveling steel, Chicago	29.00
Shoveling steel, St. Louis	28.00 to 28.50
Springs, Chicago	34.00
Steel rails, short, Chicago	34.00
Steel rails, short, Cleveland	34.00
Steel rails, short, St. Louis	32.50 to 33.00
Steel rails, old, Birmingham	28.00 to 30.00
Stove plate, Chicago	29.00
Stove plate, Cincinnati	22.50 to 23.00
Stove plate, St. Louis	25.00 to 26.00
Stove plate, N. J. points	27.25
Stove plate, Birmingham	25.00 to 26.00
Stove plate, Buffalo	27.50 to 28.00
Stove plate, eastern Pa.	29.00
Stove plate, Cleveland	25.00 to 25.50
Stove plate, Pittsburgh	26.50 to 27.00

Freight Rates, Pig Iron

Mahoning and Shenango valleys to:	
Cleveland	$1.40
Newark, N. J.	4.40
Boston	4.60
Philadelphia	4.10
Pittsburgh	1.40
St. Louis	4.60
Minneapolis, St. Paul	5.70
Buffalo to:	
Albany, N. Y.	$1.75
New England (rail)	3.90
New York and Brooklyn (rail)	3.90
Virginia furnaces to:	
Philadelphia	$4.10
New England	4.70
Brooklyn, Jersey City, Newark	4.40
Birmingham, Ala., to:	
Boston	$7.50
Cincinnati	3.60
Chicago	5.00
Cleveland	5.00
Louisville, Ky.	3.30
Minneapolis, St. Paul	7.30
New York (r. and w.)	7.50
Philadelphia (r. and w.)	6.50
Pittsburgh	6.10
Savannah, Ga.	3.40
St. Louis	4.25
Chicago to:	
Des Moines	$3.50
Minneapolis, St. Paul	2.50
Milwaukee	.60
Moline, Ill.	1.40
Omaha	4.50
St. Louis	1.90
Ironton and Jackson, O., to:	
Chicago	$3.75
Cincinnati	1.75
Cleveland	2.40
Detroit	2.60
Indianapolis	2.30
Minneapolis, St. Paul	5.70
Duluth, Minn., to:	
Minneapolis, St. Paul	$1.60
Mayville, Wis.:	
Minneapolis, St. Paul	$2.20

Freight Rates, Finished Material

Pittsburgh, carloads, per 100 lbs., to:	
New York	24.5 cents
Philadelphia	23.0 cents
Boston	27.0 cents
Buffalo	21.5 cents
Baltimore	22.5 cents
Cleveland	17.0 cents
Cincinnati	23.0 cents
Chicago	27.0 cents
Detroit	23.0 cents
Minneapolis and St. Paul	49.5 cents
Denver	$1.09
St. Louis	33.5 cents
New Orleans	38.5 cents
Birmingham	57.5 cents
Pacific coast (all rail)	$1.25
Pacific coast (tin plate)	1.25

IRON MILL USE

Angle bars, iron, Chicago	39.00
Angle bars, steel, St. Louis	32.00 to 32.50
Angle splice bars, St. Louis (iron)	37.50 to 38.00
Arch bars, transoms, Chicago	45.50 to 46.50
Arch bars and transoms, St. Louis	45.50 to 46.00
Busheling, No. 1, Cleveland	30.50 to 31.00
Busheling, No. 1, Buffalo	29.00 to 30.00
Busheling, No. 2, Buffalo	21.00 to 23.00
Busheling, No. 1, Pittsburgh	32.00
Busheling, No. 1, Cincinnati	26.00 to 26.50
Busheling, No. 1, Chicago	30.50 to 31.00
Busheling, No. 2 Chgo.	21.50 to 22.50
Busheling, No. 1, St. Louis	30.50 to 31.00
Cast borings, New York	16.25 to 16.75
Cast borings, eastern Pa.	19.00
Cast borings, Buffalo	18.00 to 19.00
Cast borings, Cleveland	18.50 to 19.00
Cast borings, Cincinnati	17.00 to 18.00
Cast borings, Pittsburgh	19.00
Cast borings, Birmingham	17.00 to 18.00
Cast borings, Chicago	18.00 to 19.00
Cast borings, St. Louis	18.50 to 19.00
City wrought, long, N. Y.	30.00
Cut forge, Chicago	32.50 to 33.00
Forge flashings, small, Cleveland	28.00 to 29.00
Forge flashings, large, Cleveland	27.50 to 28.00
Forge No. 1, eastern Pa.	28.00 to 29.00
Grate bars, Buffalo	27.50 to 28.00
Grate bars, Cleveland	25.50 to 26.00
Grate bars, N. J. points	27.25
Iron axles, Pittsburgh	46.50
Iron axles, Cincinnati	43.50 to 44.00
Iron axles, Cleveland	46.50
Iron axles, Chicago	46.50
Iron axles, eastern Pa.	46.50
Iron axles, St. Louis	46.00 to 46.50
Iron axles, Buffalo	45.00 to 47.00
Iron rails, Chicago	39.00
Iron rails, Buffalo	36.00 to 37.00
Iron rails, Cincinnati	34.00 to 35.00
Iron rails, St. Louis	38.50 to 39.00
Iron rails, Cleveland	37.00 to 38.00
Machine turnings, Cincinnati	18.00 to 18.50
Machine turnings, Cleveland	18.50 to 18.75
Machine turnings, Buffalo	17.00 to 17.50
Machine turnings, N. Y.	16.25 to 16.75
Machine turnings, Pittsburgh	18.00 to 19.00
Machine turnings, east. Pa.	19.00
Machine turnings, Birmingham	16.00 to 17.00
Machine turnings, Chicago	18.00 to 18.50
Machine shop turnings, St. Louis	18.50 to 19.00
Pipes and flues, Cleveland	28.00 to 29.00
Pipes and flues, Chicago	28.50 to 29.00
Pipes and flues, St. Louis	27.50 to 28.00
R. R. mach. cast, No. 1, Buffalo	34.00
R. R. wrgt. No. 1, Buffalo	34.00
R. R. wrgt. No. 1, east Pa.	34.00
Railroad wrgt. No. 1, Cincinnati	33.50 to 34.00
Railroad wrgt., No. 1, Cleveland	34.00
R. R. wrought, No. 1, Pittsburgh	34.00
Railroad wrgt., No. 2, Chicago	32.50 to 33.00
Railroad wrought, No. 1, Chicago	33.50 to 34.00
R. R. wrought, No. 1, Birmingham	31.00 to 34.00
No. 1 yard wrought, Eastern Pa.	33.00
No. 1 bushelings wrgt., East. Pa.	31.00
Sheet wrought, Pittsburgh	34.00
Railroad wrgt., No. 1, St. Louis	33.50 to 34.00
Railroad wrought, No. 2	32.50 to 33.00
Wrought pipe, Buffalo	27.00 to 28.00
Wrought pipe, East. Pa.	33.00
Wrought pipe, ungraded, East. Pa.	29.00

IRON OR STEEL WORKS USE

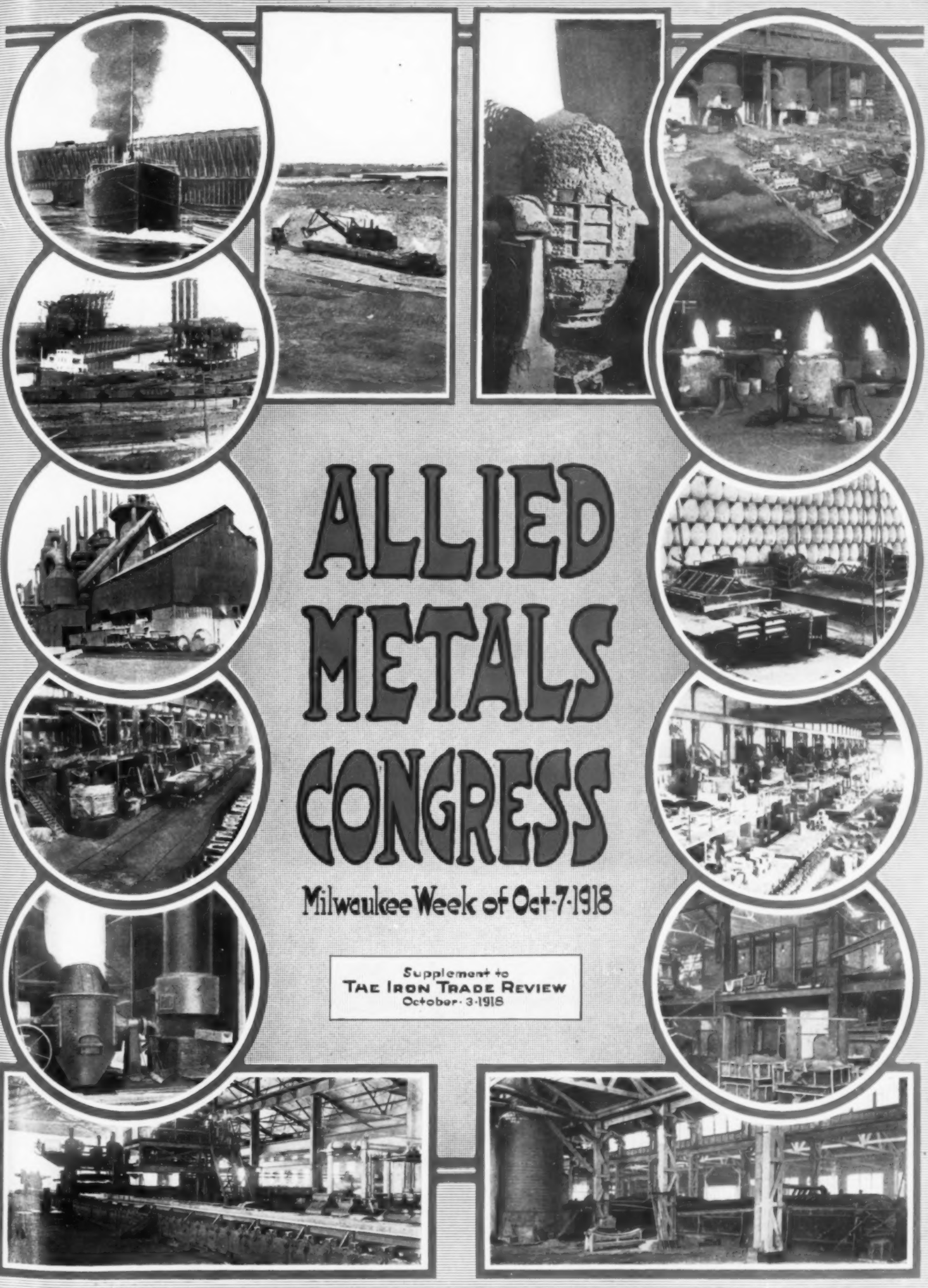
Axle turnings, Cleveland	$24.00
Axle turnings, Buffalo	24.00
Heavy axle turnings, East. Pa.	24.00
Heavy axle turnings, Pitts.	24.00
Shafting, New York	35.50
Shafting, East. Pa.	39.00
Steel car axles, Birmingham	38.00 to 40.00
Steel car axles, Pittsburgh	46.50
Steel car axles, New York	43.00
Steel car axles, Buffalo	44.00 to 46.00
Steel car axles, Cleveland	44.00
Steel car axles, East. Pa.	46.50
Steel car axles, Chicago	46.50
Shafting, St. Louis	38.00 to 39.00
Steel car axles, St. Louis	46.00 to 46.50

IRON FOUNDRY USE

Car wheels (iron), Pittsburgh	$29.00
Car wheels (steel), Pittsburgh	34.00 to 35.00
Car wheels, East. Pa.	29.00
Car wheels, Buffalo	29.00
Car wheels, Chicago	29.00
Car wheels, St. Louis	28.50 to 29.00
Car wheels, Birmingham	29.00 to 30.00
Car wheels, Cleveland	30.00
Trans car wheels, Birmingham	27.50 to 29.00
Cast, No. 1, Birmingham	31.00 to 34.00
Cast No. 1, cupola, East. Pa.	34.00
Cast, No. 1, Cleveland	33.00 to 34.00
Cast, No. 1, Cincinnati	33.00 to 34.00
Cast, 1, heavy, New York	32.25 to 32.50
Cast, 1, machy., New York	32.25 to 32.50
Cast, No. 1, Chicago	34.00
Cast, No. 1, Pittsburgh	32.50 to 33.00
Cast, No. 1, St. Louis	32.00 to 32.50
Malleable, Cincinnati	30.00 to 34.00
Malleable, Cleveland	30.00 to 34.00
Malleable, Buffalo	29.00 to 34.00
Malleable, Pittsburgh	33.00 to 34.00
Malleable, East. Pa.	29.00
Malleable, cupola, East. Pa.	33.00
Malleable, railroad, Chicago	34.00
Malleable, agricultural, Chicago	33.00 to 33.25
Malleable, railroad, St. Louis	32.00 to 32.50
Malleable, agricultural, St. Louis	31.00 to 31.50

MISCELLANEOUS USES

Boiler punchings, Chicago	36.00 to 36.50
Reroll. rails, 5 ft. and over, Pitts.	34.00
Reroll. rails, 5 ft. and over, Chi.	34.00
Rero'l. rails, 5 ft. and over, E. Pa.	34.00
Reroll. rails, 5 ft. and over, St. L.	33.50 to 34.00
Reroll. rails, 5 ft. or over, Cleve.	34.00
Rerolling rails, long, Birmingham	37.50 to 38.50
Locomotive tires, Chicago	45.50 to 46.50
Locomotive tires, St. Louis	43.50 to 44.00



ALLIED METALS CONGRESS

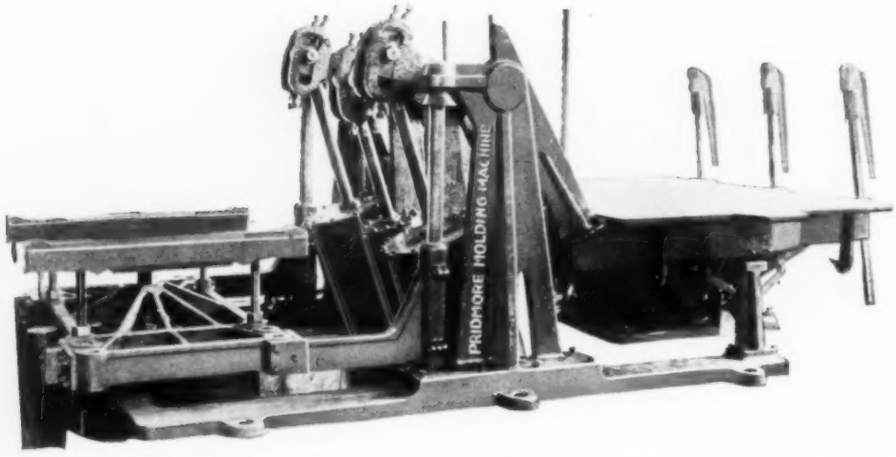
Milwaukee Week of Oct-7-1918

Supplement to
THE IRON TRADE REVIEW
October-3-1918

Pridmore

Today's Business Is

Its Objective—



Our latest 60"-24" Drop, POWER ROCK-OVER, POWER DRAW Machine in combination with our 50" x 60" ELECTRIC JARRING Machine. The roll-over capacity is 8,000 pounds.

THIS machine has been designed especially to meet such conditions. In manufacturing it we have taken in consideration the safety of operation by adding an oil check cylinder, or cushion free from all power. This cylinder is filled with oil and automatically engages as the frame or load passes over center and does not impede the speed of the machine, on the re-roll after drawing the pattern. It also has two 18" cylinders giving an enormous power. The draw is of the same type as on all *Pridmore Power Rock-Over Drop* Machines, oil cushion and three positive guides to insure absolute accuracy in drawing.

Don't Fail to See These Machines In Operation At The Foundry Convention and

HENRY E. PRIDMORE 19th and ROCKWELL STREETS CHICAGO, ILL.

Foreign Representative: J. W. JACKMAN & COMPANY, LIMITED, Show Rooms and Works, VULCAN WORKS, Blackfriars Road, Manchester. Head Office, CAXTON HOUSE, Westminster, London, S. W.

War—Make It Hum! Pridmore

Victory

Enthusiasm, energy, and above all, speed is absolutely necessary to win. Boom our Nation's business by speeding up your production with

PRIDMORE MOLDING MACHINES

Stripping Plate Machines
Round and Square;
Single, Double
and Treble Shaft

Plain Rock-Over Machines

Rock-Over Drop Machines

Power Rock-Over Drop Machines

Power Squeezer Machines

Plain Electric Jarring Machines

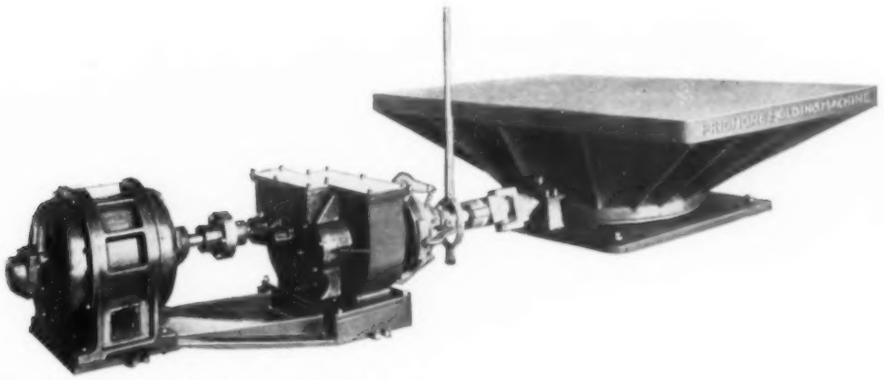
Combination Electric Jar-Ramming Power Stripping Machines

Combination Electric Jar-Ramming Hand Stripping Machines

Combination Electric Jar-Ramming Rock-Over Drop Machines

Combination Electric Jar-Ramming Power Rock-Over Drop Machines

Power Rock-Over, Power and Oil Cushion Draw Machines



6' x 9' ELECTRIC JARRING Machine one of our many types now used for war work in the production of large Steel Anchor Castings for the Emergency Fleet.

Exhibition, Milwaukee, Wis., October 7-11, 1918, Booth Nos. 261, 262, 278 and 279

HENRY E. PRIDMORE 19th and ROCKWELL STREETS CHICAGO, ILL.

Foreign Representative: J. W. JACKMAN & COMPANY, LIMITED, Show Rooms and Works, VULCAN WORKS, Blackfriars Road, Manchester. Head Office, CAXTON HOUSE, Westminster, London, S. W.

Say you saw it in THE IRON TRADE REVIEW

FLINT SHOT

Sand-blast Abrasive
A Manufactured Product

"Flint Shotting" both cleans and "inspects" the surface of the casting, forging or other metal object, as it discloses every defect that may lodge under the skin or scale.

Neither pickling nor wire-brushing will do this adequately, nor will sandblasting with a soft or irregular sand, as the latter tends to fill and *hide*, rather than *disclose*, defects.

FLINT SHOT is a remarkably effective abrasive, consisting of round, inexpressibly hard, pearl-like flint granules that are not the result of any crushing process.

Its uniformity in size, shape and hardness gives surfaces cleaned with it a beautiful *finish* that lends itself admirably to plating, enameling, lacquering or other attractive finishes.

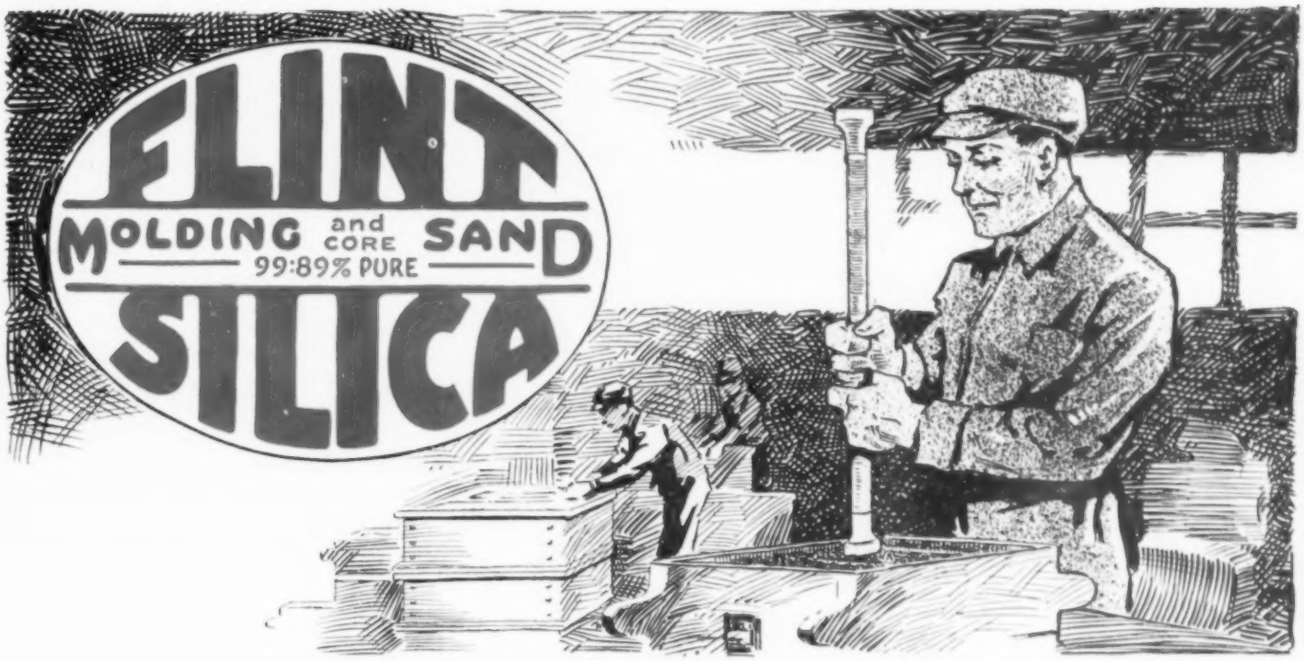
It is sold on a guarantee that 95% will rest on a 40-mesh and *all* pass thru a 20-mesh screen.

Immediate shipment in any number of carlots from stock at our factories.

Better fill your bins now as insurance against car shortage.

(*See next page*)

Send for this Book



FLINT SILICA

A washed, rewashed Steam-dried, screened, Manufactured product, Segregated from St. Peters Rock

A "FIND" for any steel foundry. A necessity in electric steel practice.

Withstands the highest temperatures. Does not burn or flux.

Has remarkable free-venting properties.

Its uniform purity and freedom from natural bonding material make it a KNOWN QUANTITY in every sand-mix formula.

Uniform *roundness* of granules gives a clean "draw".

Flint Silica contains nothing to form gases in the mold.

Send for Envelope
Sample and Quotation

United States Silica Company
1954 People's Gas Building
Chicago

Meet Us At Milwaukee

Our Exhibit will be full of interest to every man concerned with sand blasting or steel molding.

LINOIL

The Logical Oil For Cores

Used by Practically all of the L

The fact that there are 150,000 gallons of LINOIL used each month—these 150,000 gallons being distributed among practically all of the largest and best known foundries throughout the Country—backs up our claim that no other core oil is its equal.

The remarkable strength, absolute dependability, and the time and expense it saves, makes LINOIL the most valuable, efficient and economical oil—the most logical oil for cores.

LINOIL is used for the cores of over two-thirds of all the motor cylinders cast in the United States.

Surely then, it is good enough for the most particular.

THE WERNER
CLEVELAND,

BOSTON
424 John Hancock Bldg.

PORTLAND, ORE.,
731 Kearney St.

LINOIL

The Logical Oil For Cores

Largest and Best Known Foundries

LINOIL costs a little more, but it saves you money. It goes farther, and does its *work so well* that its efficiency is evident in every department of your foundry. *Just give it a trial and you will be convinced.*

We also make ARGENTINE Core Oil.

This Core Oil, altho not of such a good quality as LINOIL, is much lower in price. While LINOIL should be used for such work as automobile and aeroplane cylinder cores and other complicated cores, ARGENTINE CORE OIL is sufficiently reliable for cores of a general jobbing nature. It is a non-sticking, quick drying, non-gas-producing oil having excellent binding qualities.

WRITE US.

G. SMITH CO.

OHIO

CHICAGO
1308 Conway Bldg.

Stocks at Boston, Chicago, Seattle and Portland, Ore.

Sterling

STERLING WHEELBARROW COMPANY

J. R. SMITH, PRES. & TREAS.
T. L. SMITH, VICE PRES.
H. H. BAKER, SEC'Y.

BRANCHES
CHICAGO, ILLINOIS
NEW YORK, N.Y.
DETROIT, MICHIGAN.
CLEVELAND, OHIO.

MILWAUKEE, WIS. U.S.A.

September 26th, 1918.

OUR FRIENDS THE FOUNDRYMEN,
EVERYWHERE, U. S. A.

Gentlemen:-

Many of you will attend the FOUNDRY & MACHINE EXHIBITION to be held in Milwaukee during the week of October 7th, and our congenial sales force as listed below will all be present to Welcome you and give you the "Glad Hand."

You have given each one of them a heap of good orders for Sterling Flasks and Wheelbarrows, and they wish to tell you just how greatly they appreciate this business. They are anxious to show you the many late improvements in the Sterling Line, and they hope also to take you to our factory here in Milwaukee, just to convince you that we can most capably handle your orders.

The city of Milwaukee has shed its time worn "AMBER GLOW" and is now justly celebrated for its production of Machinery and Castings. Your time here will be time profitably spent.

Come and see us--, hang up your hat, and make yourself at home.

Very Cordially Yours,
Sterling Wheelbarrow Co.,
J. R. Smith Pres.
H. H. Baker Sec'y.

New York
WM. J. CULLEN
GEO. H. LAMBKIN

Chicago
JIM COYNE

Pittsburgh
C. L. KIRK

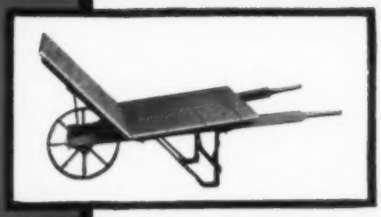
Detroit
"JIMMIE" DOPP
J. A. PATTERSON

Cleveland
L. J. SALZMAN

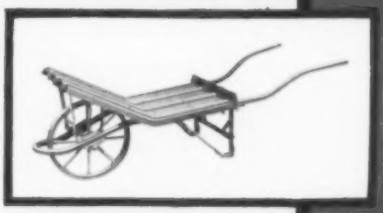
New England
"PAPA" DOWD

Factory Representatives
R. F. JORDAN
J. M. DICKSON

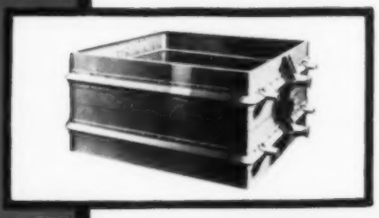
Sterling



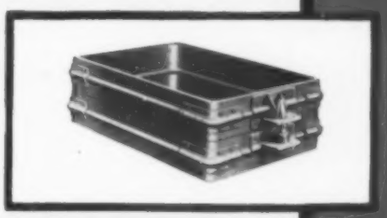
The Sterling Line of Foundry barrows includes a suitable style for every foundry requirement.

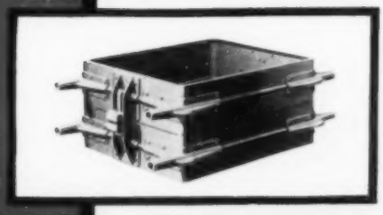


For wheeling fragile cores, heavy castings, coal or coke there is a "Sterling" just right for the job.

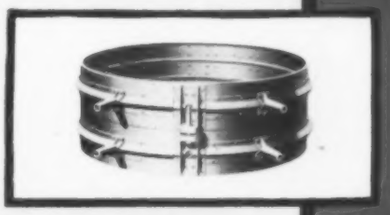


Sterling Steel Flasks are furnished in any desired size, and guaranteed to meet the most exacting requirements.





Their light weight, accuracy and correct design, increase production and make Sterling Flasks real Rush-time economy.



Loading foundries know that it pays them best to buy Sterling Steel Flasks, rather than use their molders time and valuable pig iron for making cast flasks.

STERLING WHEELBARROW COMPANY

STERLING ON A WHEELBARROW MEANS MORE THAN STERLING ON SILVER

Milwaukee Wisconsin

ALLIED — ALLIED CONSTRUCTION MACHINERY CORPORATION — ALLIED

SMITH, FASSETT & Co.,

WHOLESALE PATTERN LUMBER MERCHANTS

NORTH TONAWANDA, N.Y.

Foundrymen:

In these rush and high-prices times, it is in deed a rare opportunity to have at your command our large stock of bone dry, soft, White Pine Pattern lumber at a price much less than you would expect to pay.

Because of the interest we have in our business and the respect we have for your finished product we have this year as before made a careful selection of our stock and sorted out the choicest boards for Pattern and flask building.

We would appreciate your letting us hear from you when you are in need of Pattern or Flask lumber and in turn we will quote prices that are right. Should you favor us with your order we will ship lumber that will please you in every way.

Our Pattern lumber is strictly soft cork White Pine, bone dry, free of wind shakes and extra wide.

Our Flask lumber is strictly sound tight-knotted material and contains no large knots that will impair the strength of the boards.

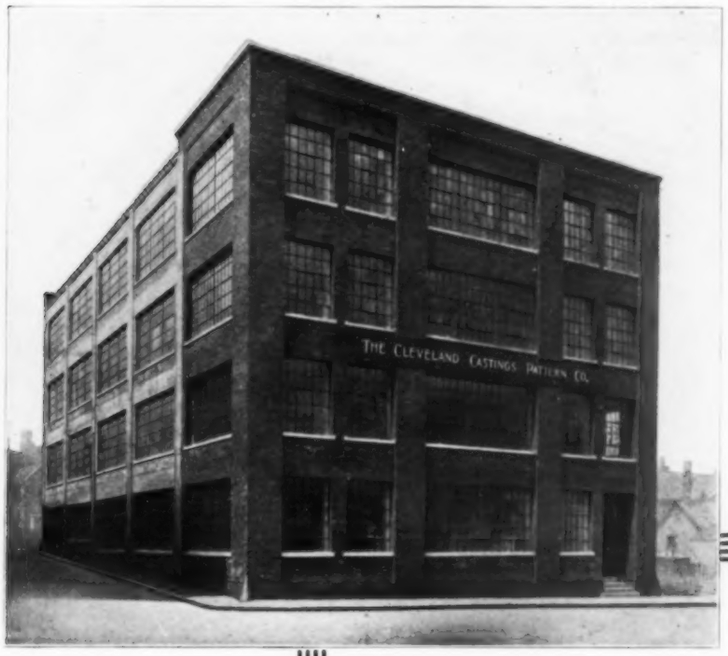
Please send us your inquiries.

Yours very truly,

SMITH, FASSETT & CO.

By Walter Nantke.

WMN JH



One of the most modern and best equipped pattern shops in the country.

Wood and Metal PATTERNS

THE CLEVELAND CASTINGS PATTERN COMPANY

It means *economy* and *quality* to have your patterns made where they are made right.

We have in our organization, men who are considered by foundrymen to be *authority* on the making of difficult patterns.

The Cleveland Castings Pattern Co.
1930 East 61st St. CLEVELAND, OHIO

Patterns that will last longer, cost less, and not check or warp, can be easily made of

Johnson's Genuine Soft White Pine

Is the **Standard in Quality** for the Iron and Steel Industry.

Every foot is specially selected, carefully graded and thoroughly seasoned. This is a guarantee of satisfaction.

Johnson Lumber Co.

MILWAUKEE WISCONSIN

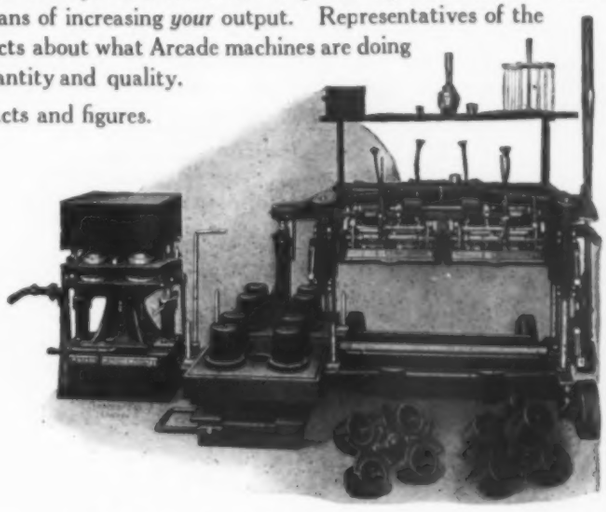
Say you saw it in THE IRON TRADE REVIEW

Help Win The War

By Greater Production

The Nation demands and rightly deserves utmost possible production from every foundry in America. Come to the Convention determined to find ways and means of increasing *your* output. Representatives of the Arcade line will be pleased to give you interesting facts about what Arcade machines are doing for others in the way of bettering output—both in quantity and quality.

Look up the Arcade representatives and talk over facts and figures.



Arcade Piston Machines

The Arcade Piston Machine is a modern, practical, efficient device for producing pistons without the use of dry sand cores. Four piston molds can be made in less time than it takes to produce one by hand. Where pistons are being produced in large quantities this machine will pay for itself in a very short time.

Tell us what size of pistons you are producing and how many—we'll be glad to give you some definite figures. Asking for information by mail, or from our representatives at the convention places you under no obligation.

Midget Core Jolter

—a machine that will do much to lower your core-room costs. It is making good in hundreds of foundries. The Midget is simple and highly efficient. It is solidly constructed for hard service and will give maximum results with little attention.

Can be supplied with either hand or knee control. Furnished in three sizes:

6-inch cylinder, having a lifting capacity of 800 lbs. 4-inch cylinder, having a lifting capacity of 400 lbs. 3-inch cylinder, having a lifting capacity of 200 lbs.

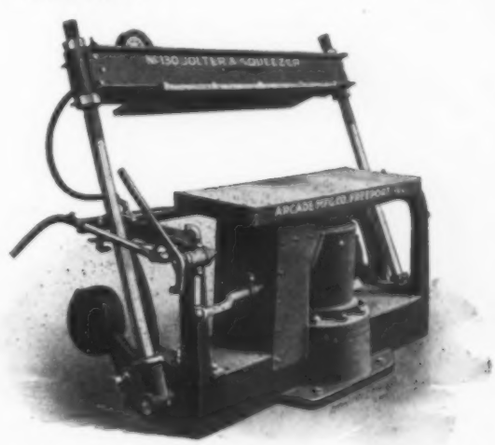
See the Midget at the Convention or refer to catalog No. 27 for further details.

Arcade Jolters and Squeezers

Practically every possible problem in squeezing and jolting molds rapidly and efficiently has been solved by our designers—and there's exactly the right size and type of Arcade Machine to meet your requirements perfectly.

Arcade Jolters and Squeezers are noted for their simple and rugged construction, ease of operation and freedom from trouble.

We can furnish Jolters and Squeezers alone, in combination, or with stripping equipment, as desired.



Brillion Pouring Device

Simplifies and makes easier the work of pouring off. This labor-saving device speeds up production and enables one man to do the work of two or three.

With a Brillion Pouring Device it is possible for the moulder who puts up the floor to pour it off, shift weights and shake out castings without assistance.

Unequalled for pouring off large floors. Built to give 100% perfect service under any conditions. Metal screen to protect eyes of operator is a great aid to accurate pouring. Ladle capacities from 200 to 1000 pounds.

See the Arcade Exhibit at the Convention

If you can't attend the Convetion in Milwaukee by all means send for Arcade catalog No. 27. Refer to it and let us quote you on any type of foundry equipment before placing your orders. Increase your production and help win the war.

ARCADE MANUFACTURING CO.

Dept. C **FREEPORT, ILL.**

The RAPID TONNAGE PRODUCER

Pulls down the cost of "overhead"; boosts up production, and takes away a great deal of the heavy, exhausting manual work of the molders.

The Rapid Molding Machine is The Only Machine of its Kind or Class in Existence. It is positively the **Fastest, Simplest** and **Most Efficient Molding Machine.**

Don't let your molders do anything a machine can do—not in these times when tonnage is demanded. Letting them do manual labor exhausts them so that you cannot get the results wanted—install **Rapid Molding Machines** and see your output jump. See our exhibit at the Milwaukee Convention.

Federal Malleable Co., West Allis, Wis.

On Exhibition with our Wisconsin Agents at Milwaukee

See the exhibit of

Foundrymen's Supply Company

IF IT'S FOR THE FOUNDRY WE HAVE IT

We can ship you sands from 21 different points—all grades of molding Sand, Fire Sand, Core Sand, Albany Sand, Sand Blast Sand, Etc. Each sand has its particular and peculiar merit for molding work.

We also specialize in sand blast sands and steel grit abrasives for this work.

Chaplets, etc.,—in fact any need of the foundryman can be supplied here. Let us know your next requirements.

84 Detroit St.

Milwaukee, Wis.

Cleveland PRODUCTS

VISITORS to the Allied Metals Congress at Milwaukee, Wis., the week of Oct. 7th, are cordially invited to visit our Exhibit spaces No. 304 and 305 in Machinery Hall and inspect our Line of Pneumatic Tools.

CLEVELAND POCKET-IN-HEAD RIVETING HAMMERS

Made in 15 styles and sizes, with Outside and Inside Latch

Most Powerful Riveter Made

Pocket-in-Head Increases Power

Shorter, Runs Faster, Hits Harder and Has Less Recoil Than Any Riveter Made

THE New Cleveland Pocket-in-Head Riveting Hammer is an ideal tool for "Field Erection Work," as it operates successfully on both high and low air pressures.

THE high speed and great power obtained through the Pocket-in-Head in conjunction with the Cleveland Tubular Valve makes the Cleveland Hammer a profitable investment from a production standpoint.

CLEVELAND CHIPPING HAMMERS

Have High Speed and Great Power

Low Cost of Upkeep

No Recoil in Operation

Absolutely Dust-proof

Piece Workers prefer the Cleveland

They are profitable Tools from a production standpoint

Write for Bulletin No. 34

CLECO AIR SEATED VALVES

The Cleco Valve is made in two styles as illustrated.

The P. O. is made in 1¼" Pipe thread Inlet and 1" Pipe thread Outlet. 1" Pipe thread Inlet and ¾" Pipe thread Outlet. ¾" Pipe thread Inlet and ½" Pipe thread Outlet.

The style F. O. is made with 1" Pipe thread Inlet and Female Bowes Coupling Outlet.

The Cleco Valve has but three parts, Body, Valve Plug and Handle. No Packing is required as the Valve Plug is Air Seated.

Absolutely Air Tight

Interchanges with Bowes Coupling

BOWES AIR HOSE COUPLINGS

Over 1,500,000 in general use. Absolutely Air-Tight under all pressures.

Interchangeable in sizes most commonly used, instantly connected or disconnected.

Write for Bulletin No. 38

THE CLEVELAND PNEUMATIC TOOL COMPANY

CLEVELAND, OHIO

New York Philadelphia Chicago Pittsburgh
San Francisco Boston Detroit Toronto, Ont.

Open Hearth Steel Castings

of every kind and description from one ounce to two tons

Our modern foundry is thoroughly equipped to handle your orders. Our capacity is ten tons per day of the highest quality *Open Hearth Steel Castings.*

We extend you a cordial invitation to visit our foundry during The Allied Metals Congress, so that we may become better acquainted.

Standard Crucible Steel Casting Company

Milwaukee, Wisconsin

ANGULAR GRIT

THE HIGH SPEED TOOL OF THE CLEANING ROOM

REG. U.S. PAT. OFF.

The Abrasive that is cleaning Uncle Sam's Shells "Right"

***Angular Grit* is the ideal metallic blasting abrasive.**

Its edges are all angular, irregular cutting points which leave a clean, smooth surface after coming in contact with the casting or forging. It does not break up into dust like sand but can be used over and over again, one ton equaling car loads of sand. Cleans quicker and better than the globules, shot.

Let us send you samples.

PITTSBURGH CRUSHED STEEL CO.

SOLE MANUFACTURERS

PITTSBURGH, PA.

ESTABLISHED 1888.

Say you saw it in THE IRON TRADE REVIEW

NATIONAL

MALLEABLE CASTINGS

THE cumulative results of 50 years of research, investigation and experience are embodied in every malleable casting produced at our four large plants.

During these fifty years we have made thousands of tons of NATIONAL MALLEABLE CASTINGS which can be found in every activity of our industrial life.

For whatever purpose malleable castings are used you will find NATIONAL MALLEABLE CASTINGS employed.

Every NATIONAL MALLEABLE CASTING made is subjected to thorough inspection. Every NATIONAL MALLEABLE CASTING sold will be furnished subject to rigid test.

Specify

NATIONAL MALLEABLE CASTINGS

The National Malleable Castings Company

CLEVELAND

MALLEABLE IRON PLANTS AT

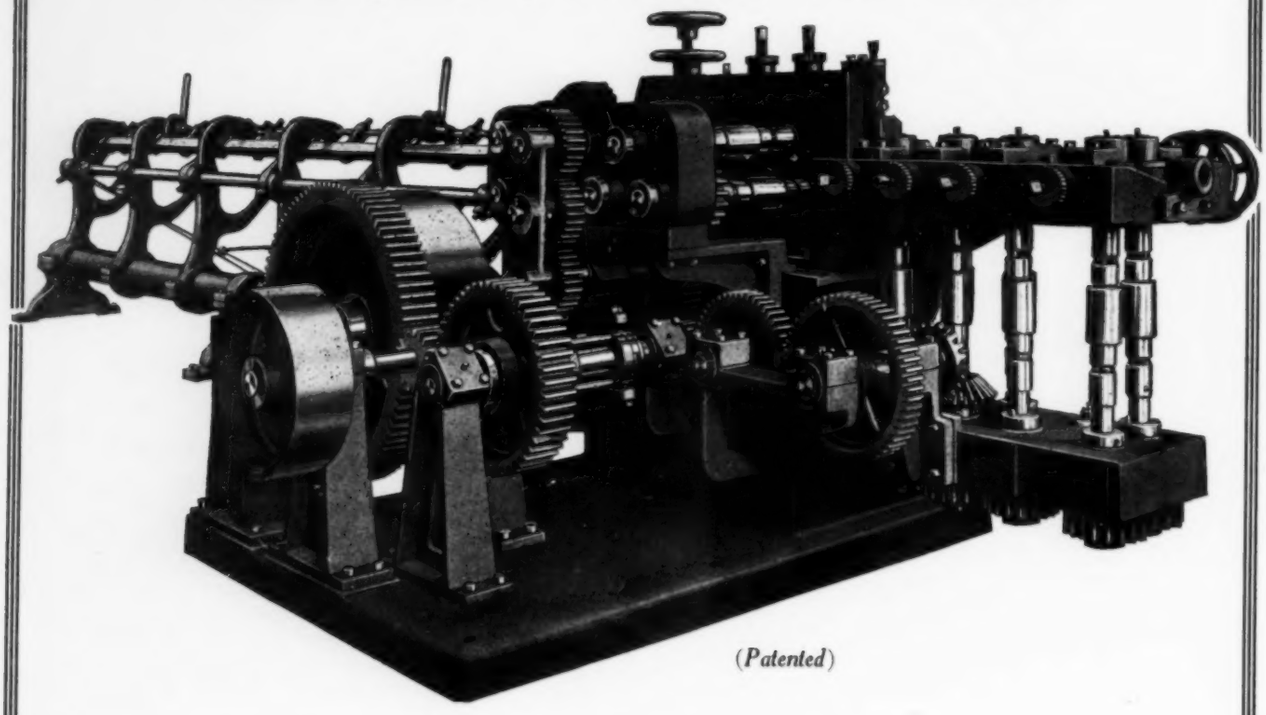
CLEVELAND CHICAGO INDIANAPOLIS TOLEDO

Milwaukee Steel Foundry Co.
INCORPORATED 1903
101-121 South Water Street
MILWAUKEE, WIS.

Say you saw it in THE IRON TRADE REVIEW

STRAIGHTENER AND CUTTER

For Squares, Hexagons and Flats



(Patented)

This machine takes the material from the coil, straightens it and cuts it to accurate lengths.

It is arranged to be driven by one belt directly from the motor.

A number of sizes of stock can be handled in one set of rolls because the universal joints in the roll and roll gear shafts permit wide adjustment of the rolls while allowing the gears to remain stationary.

Handles all kinds of steel, brass, aluminum, or any kind of metal and is made in several sizes.

Catalogue T on request

THE F. B. SHUSTER CO., New Haven, Conn.

Formerly John Adt & Son **Established 1866**

Also makers of Automatic Wire Straighteners and Cutters, and Riveting Machines

Pickands, Mather & Co.
CLEVELAND, OHIO.

Birds-eye View of Toledo Furnaces

PIG IRON
COAL
IRON ORE

All grades and analyses, Soft, and Strong Foundry, Malleable, Basic, Forge, Silvery and Bessemer Ferro Silicon Irons.

Shipments made from:

Toledo Furnace Co., Toledo, O.
United Furnace Co., Canton, O.
Perry Iron Co., Erie, Pa.
Jackson Iron & Steel Co.,
Jackson, Jackson County, O.

HIGH SPEED

TRADE MARK

Reclaim your scrap High-Speed Steel

by the

ONONDAGA PROCESS

AFTER making additions of new material especially selected to meet the needs of the process, your scrap is converted into ingots, and then manufactured into the finished product by methods in accord with the highest state of the steel makers' art.

We will return to you in place of your scrap, an equal weight of High Speed Steel Bars, annealed, ready for machining or forging; or bars cut to short lengths for cutters, inserts or tool holder bits.

Let us help you realize the full value of your High Speed Scrap.

ONONDAGA STEEL COMPANY INC.
INCORPORATED
SYRACUSE NEW YORK

HIGH SPEED

Say you saw it in THE IRON TRADE REVIEW

The Cleveland-Cliffs Iron Co.

PRODUCERS AND SELLERS OF

Lake Superior Iron Ores

Charcoal Pig Iron

Chemical Products

Refined Methyl (Wood) Alcohol
Refined Wood Creosote Oils
Refined Methyl Acetone
Pure Acetone — Acetic Acid
Formaldehyde — Sulphuric Acid
Hexamethylenamine
Hardwood Charcoal

Forest Products

Lumber — Hemlock Bark

General Offices
Rockefeller Bldg.

C I C
TRADE MARK

Cleveland, Ohio
U. S. A.

Say you saw it in THE IRON TRADE REVIEW

Sheets and Plates

Our sons, our brothers, our friends—are "over there" shedding their life's blood. They are—every one—ready to give their all for that same Freedom which, when boys, we learned to cherish.

Is it not right then that we express our sympathies not only by word, but also by deed?

Should we not do all that is within our power to shorten the war, thus lessening their danger?

Liberty Bonds, War Stamps, Thrift Stamps, Red Cross—these are mighty big helps.

But we must do more.

That is why the entire production of the Cleveland Steel Company is at the disposal of the United States Government.

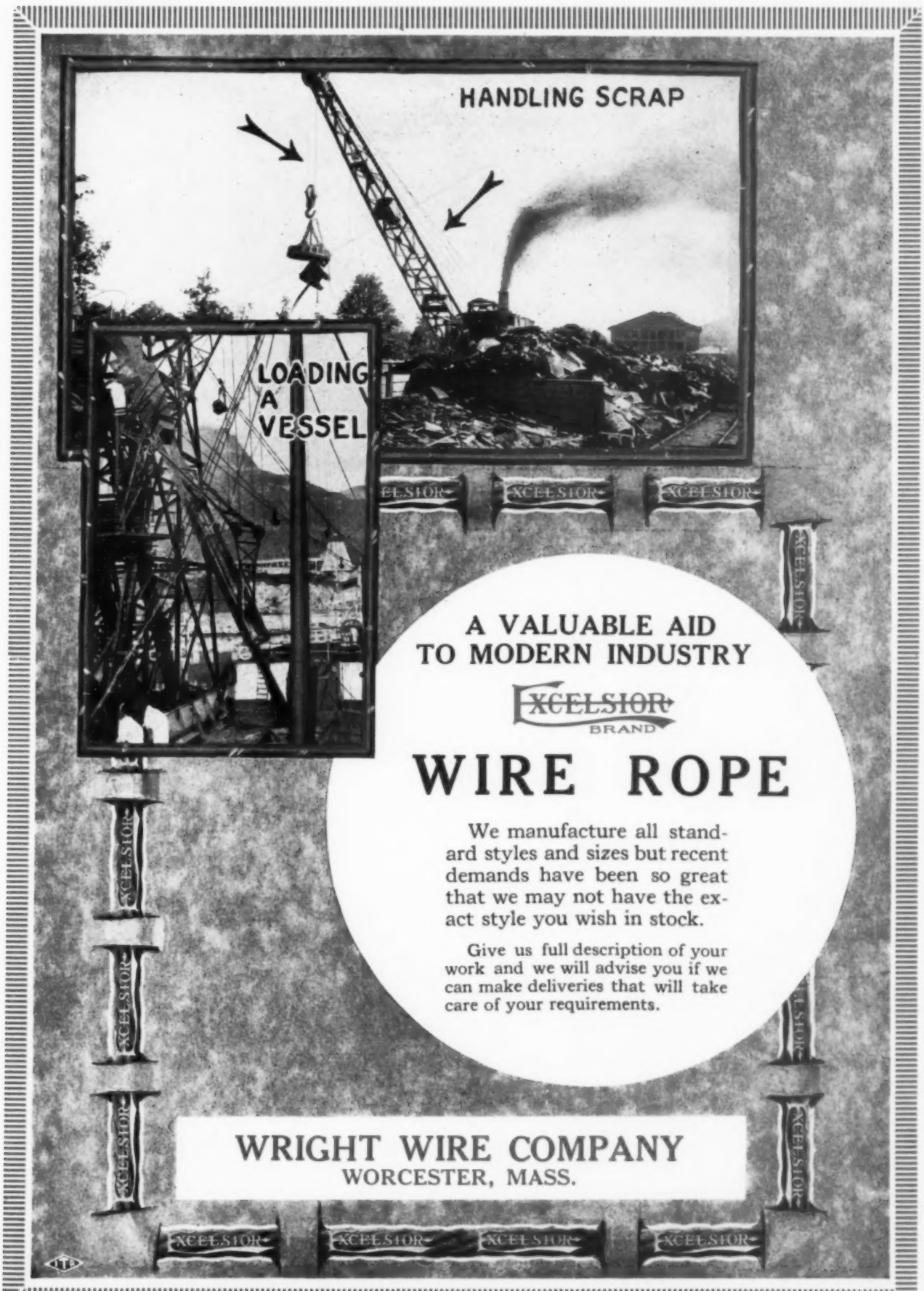
For we are doing our best to be 100% perfect.

The Cleveland Steel Co.

Rockefeller Building, Cleveland, Ohio

DISTRICT REPRESENTATIVES:

J. V. Cowling & Co., 208 S. La Salle St., Chicago
F. Walter Guibert, Ford Building, Detroit, Mich.
Rank & Goodell, Merchants Bank Bldg., St. Paul, Minn.
Beckwith Brothers, Chemical Building, St. Louis, Mo.
Geo. T. Cook, Finance Building, Kansas City, Mo.
C. F. Lape, 104 Stimpson Building, Los Angeles, Cal.


HANDLING SCRAP
LOADING A VESSEL
A VALUABLE AID TO MODERN INDUSTRY
EXCELSIOR BRAND
WIRE ROPE
We manufacture all standard styles and sizes but recent demands have been so great that we may not have the exact style you wish in stock.
Give us full description of your work and we will advise you if we can make deliveries that will take care of your requirements.
WRIGHT WIRE COMPANY
WORCESTER, MASS.

SKIP HOISTS
Can Stand
Mighty Stiff Service

STEEL mill and furnace work is mighty stiff service. Usually it means twenty-four hour days and three hundred and sixty or more days a year—the kind of service which will soon tear the heart out of either man or machine that cannot stand the strain of working day in and day out and then being always ready for more.

Such service demands simple, sturdy, reliable machines which have plenty of endurance and which can take severe punishment without flinching; and as these are the characteristic qualities of properly built skip hoists, the skip hoist first proved its real worth in steel mill and furnace service.

Gradually other industries have taken advantage of the good features of skip hoists and today they are replacing elevators for all important work which demands greater dependability than elevators can give.

Steel Mills, Furnace Plants, Mines, Power Plants, and other Industrial Works are using Bartlett and Snow Skip Hoists for elevating coal, ashes, ores, limestone, flue dust, sinter, slag, rock and chemicals. They are using them because they are simple, sturdy, reliable, economical, and have proved themselves well able to stand the rack of service which is as stiff as any service can be.

Complete data to those who desire it

THE C. O. BARTLETT & SNOW COMPANY

Main Office and Works: Cleveland, Ohio

Eastern Office: 50 Church Street, New York, N. Y

Cleveland foundry Westinghouse Electric and Manufacturing Company Equipped with Bartlett & Snow Foundry Sand Handling Equipment and Bartlett & Snow Elevators and Conveyors for castings and cores.

Equipment that helps foundries get greater production

Bartlett & Snow Foundry Sand Handling Equipment provides the means of eliminating most of the labor in connection with the handling and preparation of molding sand.

Bartlett & Snow Elevators and Conveyors for sand, cores, molds, and castings eliminate much labor—enough usually to pay for themselves within a short time.

Bulletin 45 suggesting specific methods of eliminating labor, speeding up production, and bettering foundry working conditions will be gladly mailed to any one interested in doing these things.

THE C.O.BARTLETT & SNOW CO.

MAIN OFFICE & WORKS, CLEVELAND, OHIO. U.S.A.

EASTERN OFFICE AT NEW YORK, N.Y.

An Invitation to

American Foundrymen

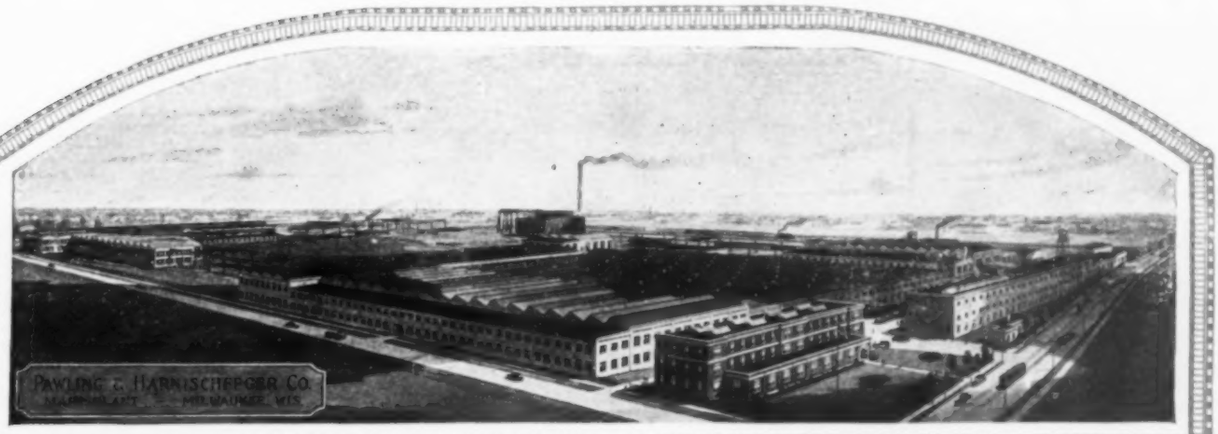
to visit the largest and most modern plant of its kind in the United States. You are all acquainted with P & H. Traveling Cranes, Single-Line Grab-Buckets, and Drilling and Boring Machines; come and see where and how they are made. We are justly proud of our plant and facilities and we should like to show you why we are. Put us down on your list of engagements; old friends as well as new.

PAWLING & HARNISCHFEGER CO.
38th & National Avenues
MILWAUKEE WISCONSIN

Manufacturers of
ELECTRIC TRAVELING CRANES
SINGLE-LINE GRAB-BUCKETS
DRILLING & BORING MACHINES
EXCAVATING & TAMPING MACHINES

QUALITY P&H SERVICE

Say you saw it in THE IRON TRADE REVIEW

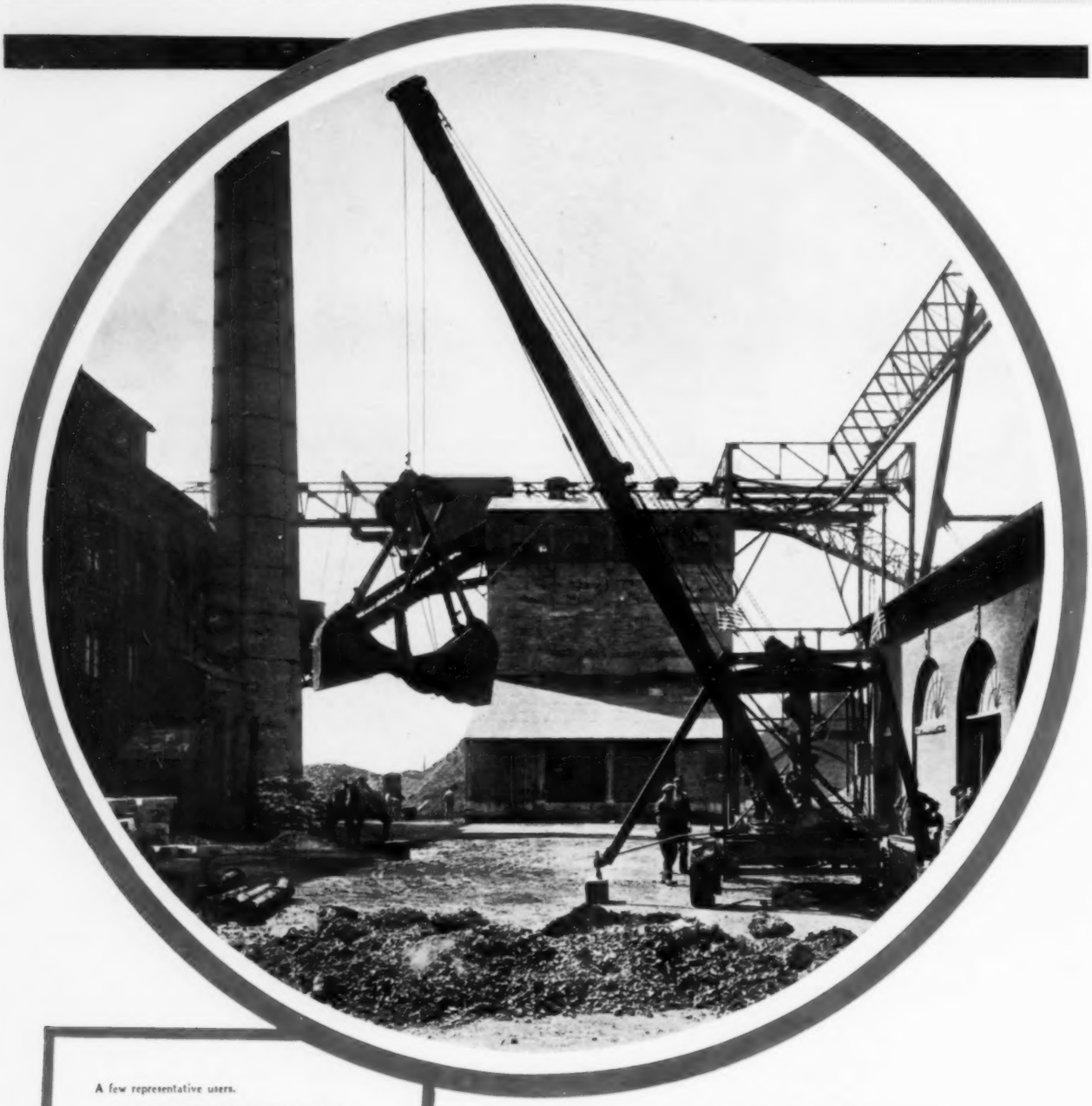


In the early days of the crane industry we had many struggles for the principle of ***caveat emptor*** and "let the buyer beware" is foreign to the policies of this organization; we persisted in designing and building our cranes with exacting care and of the best materials obtainable ***always***. Such a practice meant a proportionately higher price with the result that competition from lower-priced and lower-quality builders was very keen, for buyers did not exercise so much caution in those days; needs were too pressing at that growing period of American industry. We maintained our standard, however, determined to build up a business and a product that should improve with the years, rather than reap a doubtful, temporary harvest.

Today the symbols "P & H" gives the buyer assurance that the mechanism embodies all the advantages which time and continuous effort have—research, the accumulation of authoritative data, the contributions of inventive genius, and the practical knowledge growing out of thirty years of crane building.

PAWLING & HARNISCHFEGER COMPANY
MILWAUKEE WISCONSIN

QUALITY P&H SERVICE



A few representative users.

UNITED STATES GOVERNMENT

Over fifty Auto Cranes used by various departments of the government in this country and abroad.

IRON AND STEEL PLANTS

American Sheet & Tinplate Co., 2 Machines
Belle City Malleable Iron Co., Racine, Wis.
Colorado Fuel & Iron Co., Denver, Colo.
Whiting Foundry & Equipment Co., Harvey, Ill.
Illinois Malleable Co., Chicago, Ill.
Lukens Iron & Steel Co., Coatesville, Pa.
Malleable Iron Fitting Co., Branford, Conn., etc.

GAS AND ELECTRIC LIGHT COMPANIES

Peoples Gas Co., Chicago, Ill., 2 Cranes
Public Service Co., Chicago, Ill., 2 Cranes
Detroit City Gas Co., Detroit, Mich.
Rochester Ry. & Lt. Co., Rochester, N. Y.
Utica Gas & Electric Light Co., Utica, N. Y., etc.

AUTOMOBILE PLANTS

Buick Motor Co., Flint, Mich.
Reo Motor Co., Lansing, Mich.
Studebaker Corp., Detroit, Mich.
Hudson Motor Co., Detroit, Mich.
Republic Motor Truck Co., Alma, Mich.
Maxwell Motors Co., Detroit, Mich.
Chevrolet Motors Co., New York, N. Y., etc.

Byers Auto-Crane

For Material Handling or Excavating Work.

Operated with *clamshell* or *orange peel buckets, hook, skip* or *magnet.*

Mounted for *rail trucks; road wheels* or *caterpillar.*

Steam, Gasoline or Electric power.

Write for Bulletins 1011, 1012 and 1013.

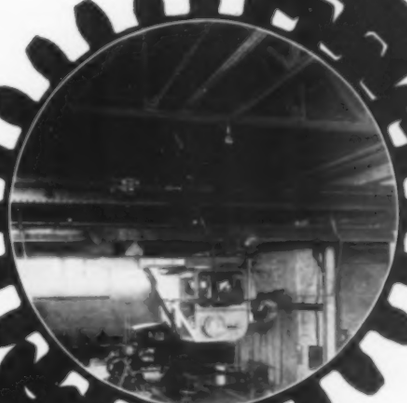
The John F. Byers Machine Co.

235 Sycamore St. Ravenna, Ohio

SHEPARD ELECTRIC HOISTS

Lighten the Tasks of the Men at Home

No doubt you are short of help in your plant. The men left are working under a big handicap. Why not help to lighten their labors by adopting the most efficient handling methods?

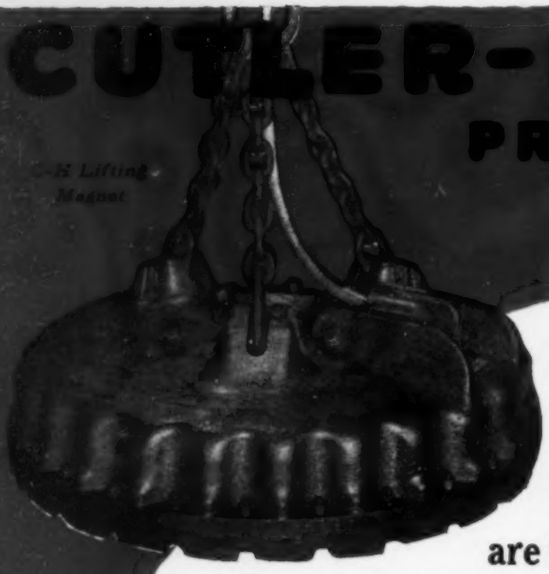


HOIST BUY A SHEPARD

Shepard Hoists can be utilized to great advantage by doing all the heavy lifting, leaving the men free to do more important tasks. : : : : : Write for a copy of Handbook "B" and "Hoist—Buy a Shepard."

SHEPARD
ELECTRIC CRANE & HOIST CO.
New-York Philadelphia Montour Falls, N.Y. Chicago Pittsburgh
Boston, Baltimore, Birmingham, San-Francisco, Montreal, Melbourne, London.

CUTLER-HAMMER
PRODUCTS FOR THE FOUNDRY



Foundry-Men and Engineers are familiar with

the higher lifting capacities and efficiency of C-H Lifting Magnets. They have withstood every service including under-water service salvaging sunken cargoes.

The new Enclosed Safety Starter with operating handle outside of case is for use with all kinds of motor-driven machines where squirrel cage motors of small capacities are used.

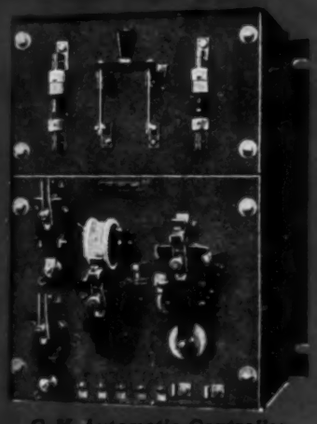
C-H Crane and Hoist Controllers of the Drum type are recognized by the experienced man by the non-stubbing fingers and the easily removable finger support. There is no smoother nor more positive movement than provided in these controllers.

Automatic Motor Starters and Controllers are made in every size and for every type of motor—C-H Automatics have been made since the very earliest application of automatically controlled electric motors.

Magnetic Separator Pulley operation depends on their design and construction. C-H experience in magnets, magnetic clutches, brakes, and solenoids is the reason for the position held by C-H Magnetic Separators.

C-H 91-16 Enclosed Starter

C-H Crane Controller


C-H Automatic Controller

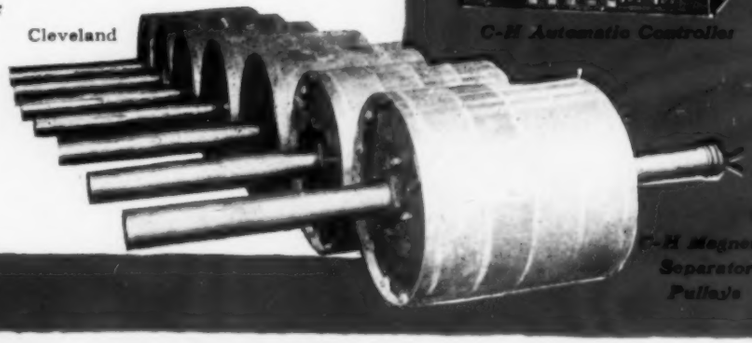
Visitors at the Allied Metals Congress are invited to visit us. Take the Clybourn car and get off at 13th Street.

THE CUTLER-HAMMER MFG. CO.
MILWAUKEE, WIS.

BRANCH OFFICES:

New York, Boston, Chicago, Cleveland, Pittsburgh, Philadelphia, Cincinnati, San Francisco, Los Angeles, Seattle

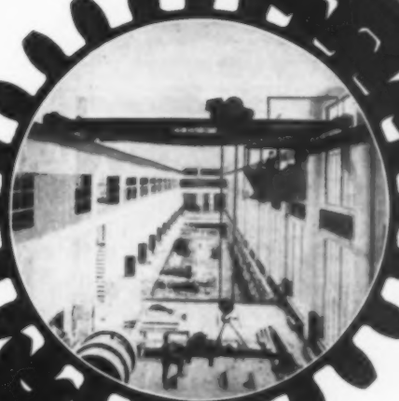
C-H


C-H Magnetic Separator Pulleys

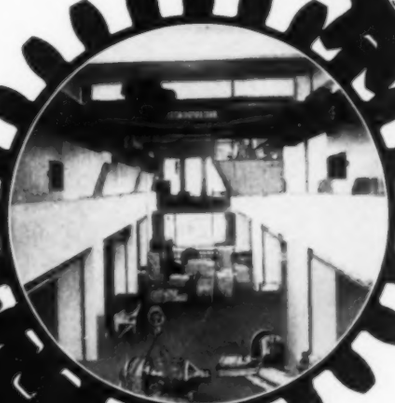
SHEPARD
ELECTRIC CRANES

THEY ALL AGREE

More than 90 diversified Industries unite in agreeing that SHEPARD ELECTRIC CRANES are the most reliable efficient and economical type of hoisting equipment.



HOIST BUY A SHEPARD



The distinctive features of SHEPARD design are Balanced Drive; Permanent Alignment; Total Dirt Exclusion; Unit Frames & Enclosures Consulation with SHEPARD Engineers is free - Write now and *Hoist Buy a SHEPARD*

SHEPARD
ELECTRIC CRANE & HOIST CO.
New-York Philadelphia Montour Falls, N.Y. Chicago Pittsburgh
Boston, Baltimore, Birmingham, San-Francisco, Montreal, Melbourne, London.

Why Rex Chain Was Standardized Late

At least seven million feet of certain types of iron chain wear out each year because their design was prematurely standardized.

Such chains still have side bars of uniform thickness.

But the weaving and side sway of chain under load exerts a breaking strain that is not uniform.

It is viciously focused on the side bar at a point near the cross-barrel, causing frequent breakage.

REX CHAINS avoid this breakage because they were standardized late.

Their side bars are designed like a cantilever beam.

At the section of exceptional strain the side bars are therefore exceptionally strong. This cantilever design is only one of the REX features that late standardization has made possible.

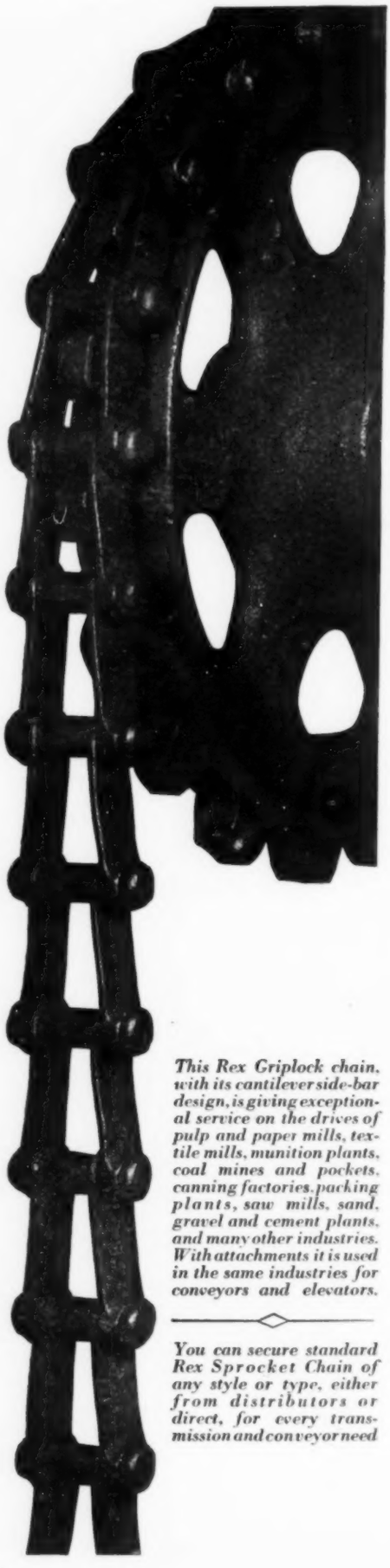
Another is the GRIPLOCK method of linking, which makes chain much stronger than its link pins. Another is the machine-turning of rollers, so that Rex Roller Chain tracks true and prevents the breakage due to sticking.

These and many others all contribute material aid in making REX CHAIN save power, labor and money.

REX CHAIN

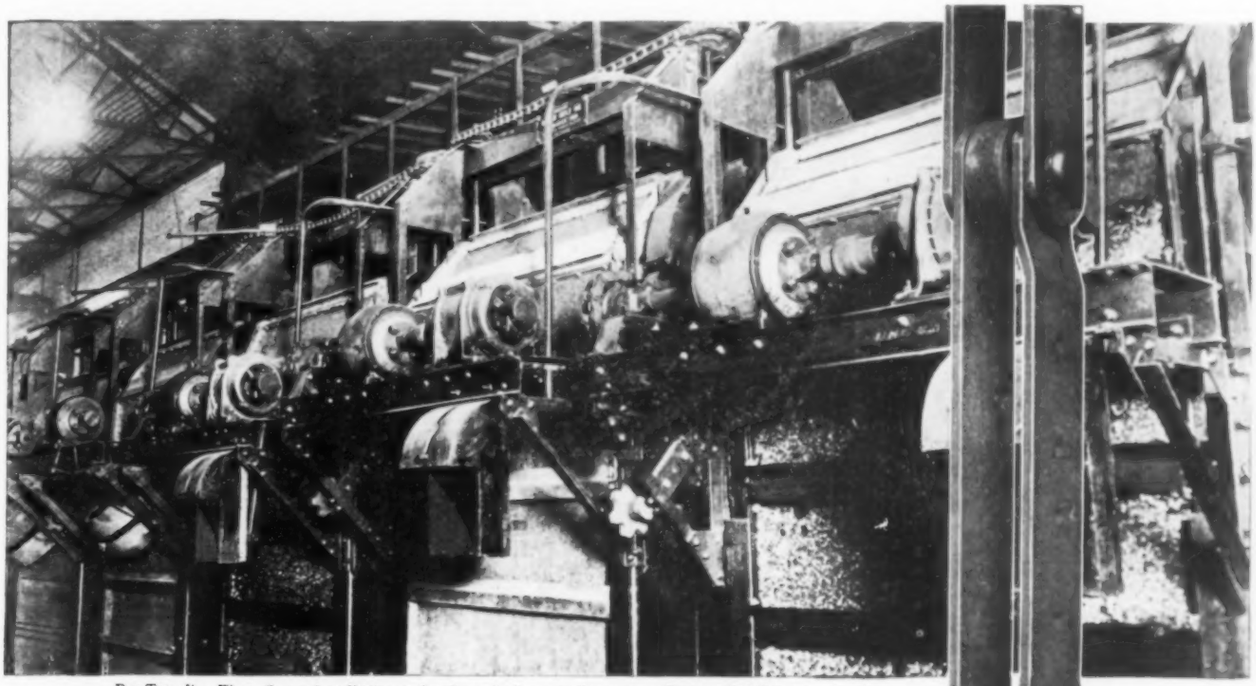
Rex Traveling Water Screens, Rex Concrete Mixers, Rex Sprockets, Rex Elevators and Conveyors

CHAIN BELT COMPANY, MILWAUKEE



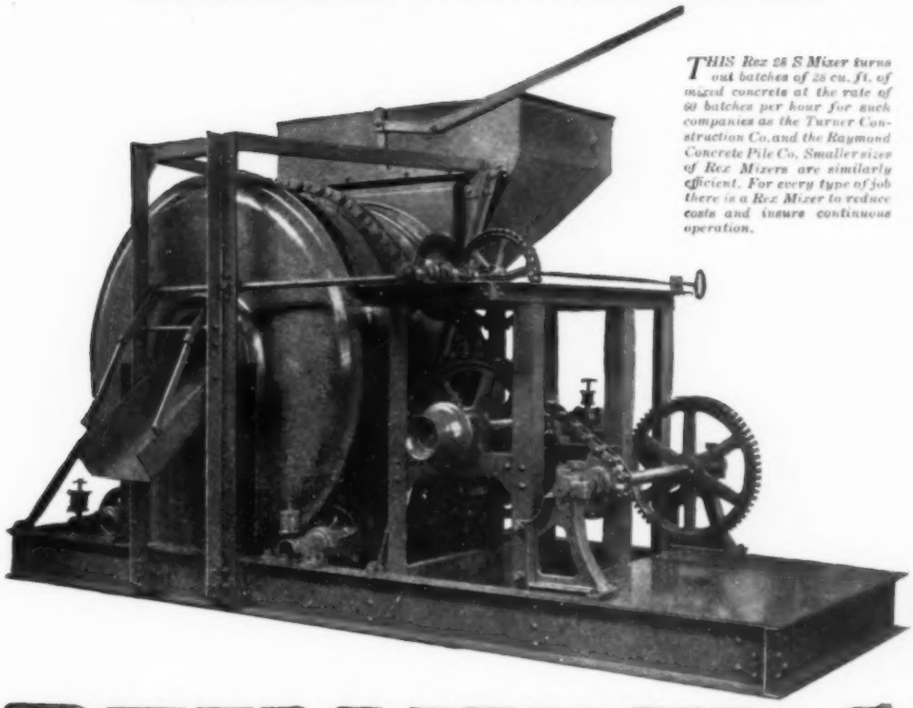
This Rex Griplock chain, with its cantilever side-bar design, is giving exceptional service on the drives of pulp and paper mills, textile mills, munition plants, coal mines and pockets, canning factories, packing plants, saw mills, sand, gravel and cement plants, and many other industries. With attachments it is used in the same industries for conveyors and elevators.

You can secure standard Rex Sprocket Chain of any style or type, either from distributors or direct, for every transmission and conveyor need



Rex Traveling Water Screen installation at the plant of a large steel company—Battery of 10 Screens

REX TRAVELING WATER SCREENS



THIS Rex 28 S Mixer turns out batches of 28 cu. ft. of mixed concrete at the rate of 60 batches per hour for such companies as the Turner Construction Co. and the Raymond Concrete Pile Co. Smaller sizes of Rex Mixers are similarly efficient. For every type of job there is a Rex Mixer to reduce costs and insure continuous operation.

REX MIXERS

FOR PERMANENCE IN CONCRETE

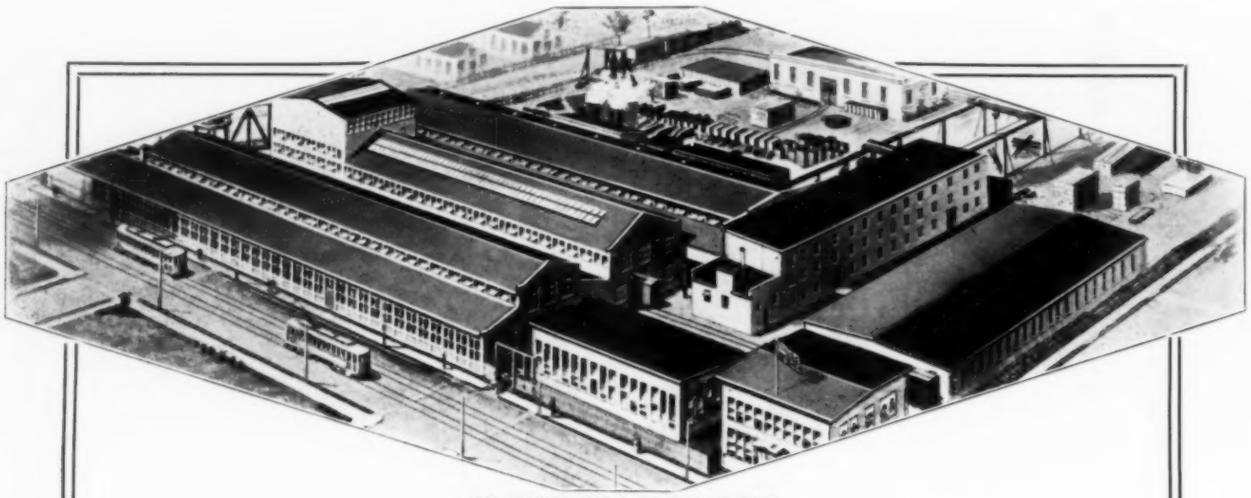
Rex Chains, Rex Traveling Water Screens,
Rex Sprockets, Rex Elevators and Conveyors

CHAIN BELT COMPANY, MILWAUKEE

Rex Steel Roller Chain used for carrying the baskets of Rex Traveling Water Screens

You can secure standard Rex Sprocket Chain of any style or type, either through distributors or direct, for every transmission and conveyor need

Say you saw it in THE IRON TRADE REVIEW



EXTERIOR VIEW OF OUR PLANT

THE PLANT—

A large modern plant fully equipped with up-to-the-minute machinery for the rapid and economical production of electric traveling cranes.

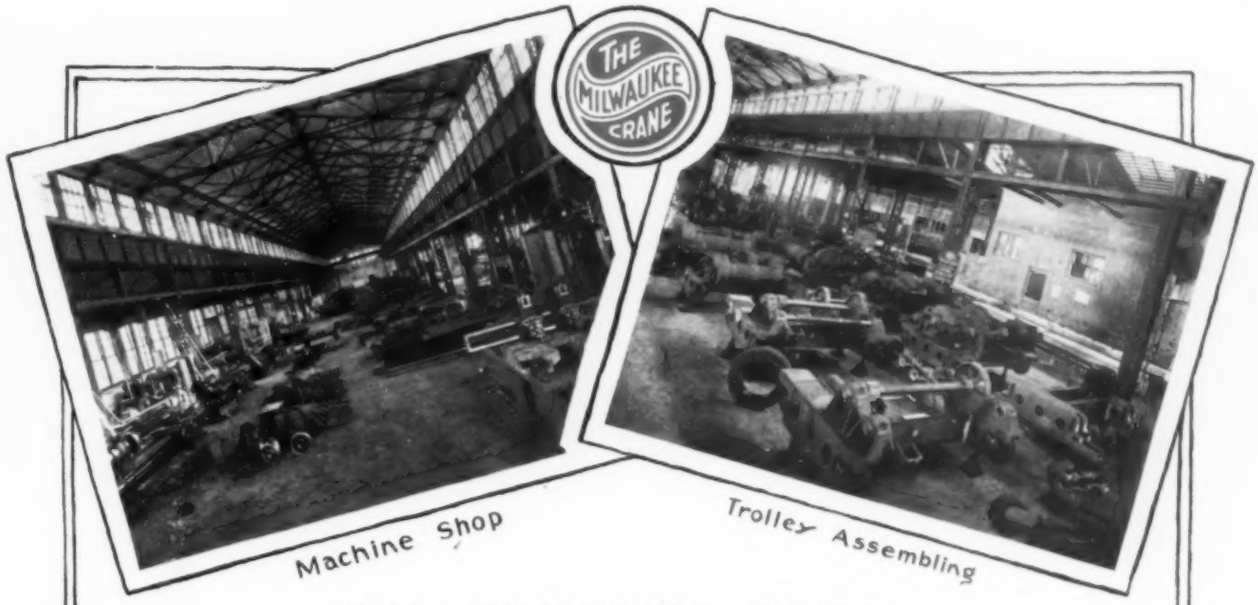
THE PRODUCT—

"The Milwaukee Crane"—the result of many years experience in crane building. It embodies substantial design; high-class workmanship; steel gears; bronze self-oiling bearings throughout; accessibility; and all modern safety features.

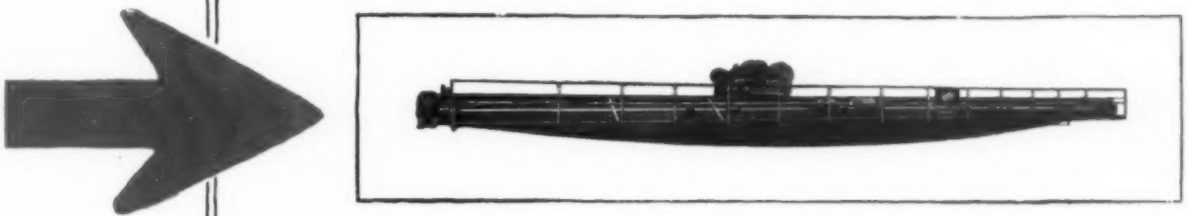
THE TRADE MARK—

Indicates the highest class of material and workmanship, fully bearing out Milwaukee's reputation for turning out manufactured products of the highest excellence.

THE MILWAUKEE CRANE



-THE MILWAUKEE CRANE-



MILWAUKEE ELECTRIC CRANE & MFG. CO.

NEW YORK
50 CHURCH ST.

INCORPORATED

PITTSBURGH
704 EMPIRE BLDG.

Milwaukee, Wisconsin

Say you saw it in THE IRON TRADE REVIEW

Hayward ELECTRIC MOTOR Buckets

CONTROLLED BY THE MOVEMENT OF A SWITCH

ESSENTIAL

THE time and labor saving features of Hayward Electric Motor Buckets earn for them a high place on the list of essentials.

No foundry which would avoid overtaxing labor and profits should be without at least one of these buckets for mixing, cutting or conveying sand and the handling of coal or other loose materials.

We particularly recommend the Electric Motor Bucket for foundry use because of its positive control and its ability to work effectively in short headroom, but we make all types of buckets for every foundry or steel mill service.

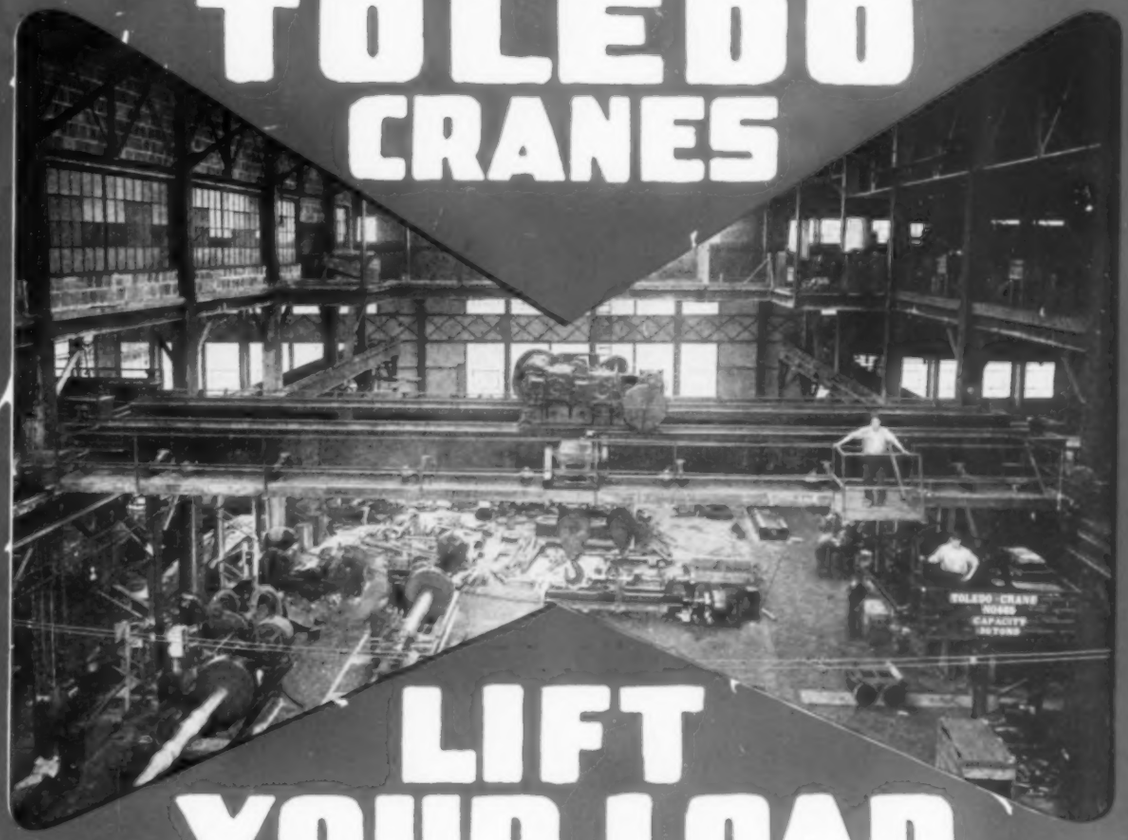
See Catalog 44

The Hayward Company

46-50 Church Street
NEW YORK

2518-Y

LET
TOLEDO
CRANES



LIFT
YOUR LOAD

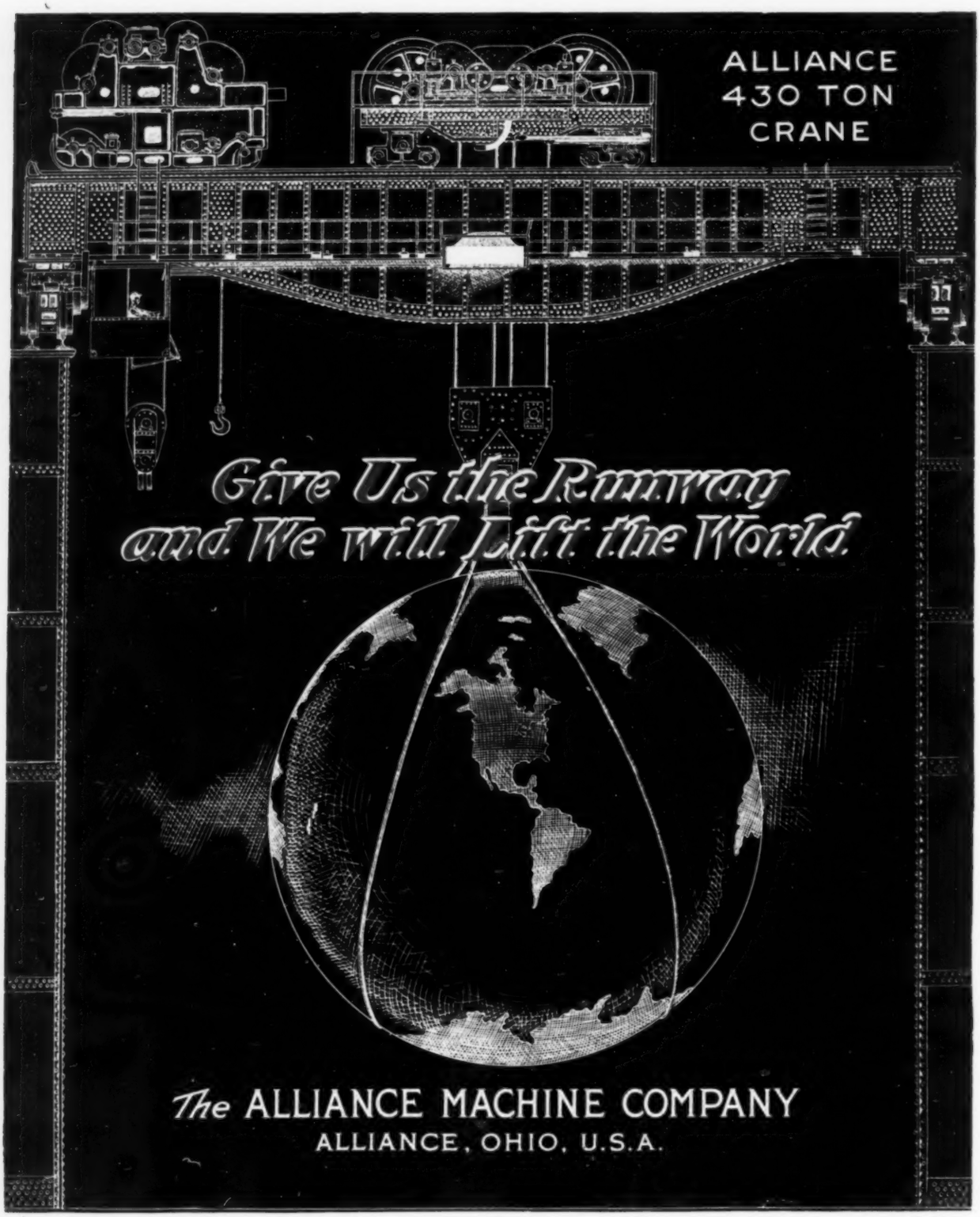
Speedy production depends upon the ability of a plant to handle its material during the process of manufacture.

Inadequate methods for moving heavy material cause floor congestion and slows up production.

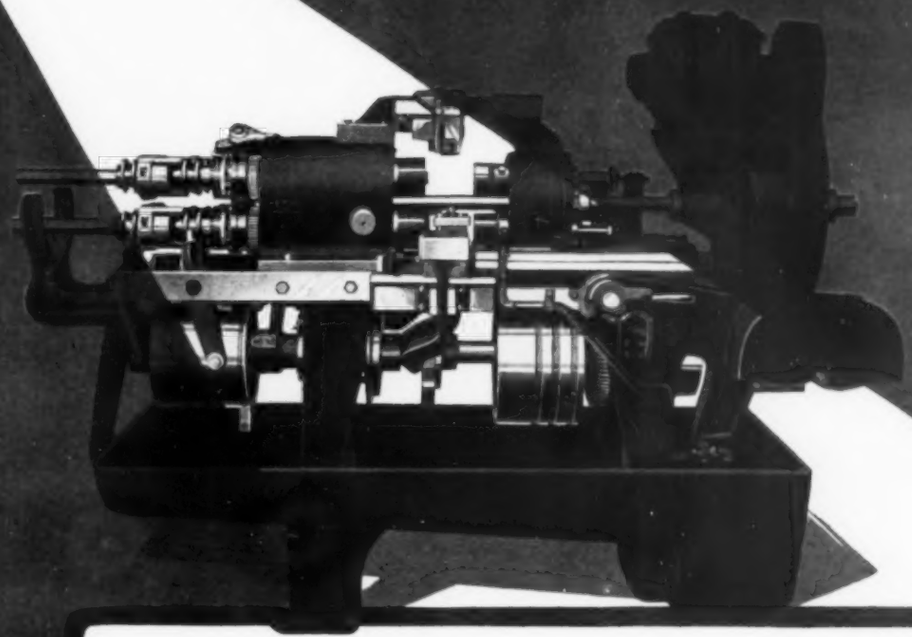
Toledo Cranes insure systematic and speedy handling of all kinds of material. They are ***dependable, durable*** and ***safe.***

Let us figure on your installation.

Toledo Bridge & Crane Co.
TOLEDO, OHIO


ALLIANCE
430 TON
CRANE
Give Us the Runway
and We will Lift the World.
The ALLIANCE MACHINE COMPANY
ALLIANCE, OHIO, U.S.A.

The Searchlight of Efficiency



The business of war production demands the speed and accuracy of

Acme Multiple Spindle Automatics

Meeting of war time output schedules has emphasized the importance of the Acme Standard for continuous operation—month in and month out.

Meeting of new and specific war tolerances is each day piling up new evidence of Acme Accuracy—the kind that endures.

Turn your searchlight of investigation on the Acme—ask how many per hour from your samples or blue print.

Capacity up to $3\frac{3}{4}$" dia.

THE NATIONAL ACME COMPANY

New England Plant WINDSOR, VERMONT — **CLEVELAND, OHIO** — **Canadian Plant** QUEBEC

Branch Offices: New York Boston Chicago Detroit Atlanta San Francisco With Foreign Representatives

Makers of Gridley Single and Multiple Spindle Automatics at Windsor, Vt., and Acme Automatics, Threading Dies, Collapsing Taps, and Screw Machine Products at Cleveland, O., Screw Machine Products at Quebec, P. Q.

We Build

"The
STANDARD" SCALE

for every purpose in every business

We make a specialty of steel mill and Foundry Scales, both stationary and portable, and in special designs to meet particular requirements.

They are constructed upon the lines of strength and durability, and are unsurpassed for their accuracy and sensitiveness.

"The Standard" Modern 150-Ton Railroad Track Scale

Built as strong as a bridge. "The Standard" Railroad Track Scales are of massive construction, with capacity of 300,000 pounds. They will withstand the pressure of long and short freight cars, locomotives and coupled cars in train order.

Write today and ask for Catalogue No. 76.

THE STANDARD SCALE & SUPPLY CO.
PITTSBURGH, PA., U. S. A.

NEW YORK
145 Chambers St.

PHILADELPHIA
523 Arch St.

CHICAGO
163-171 North May St.

CLEVELAND
1547 Columbus Road

Kreolite Wood Block Floors
"They outlast the factory"

Kreolite Wood Blocks Conserve Labor

Patriotism demands conservation of the diminishing supply of Man-power for industrial purposes.

Kreolite Wood Block Truckways used in connection with modern lift trucks, increase production and decrease handling costs at the Modern Foundry Co., Cincinnati. This company now have Kreolite Wood Block truckways all through their pig iron storage yards.

The iron is handled only once, being placed on small wooden platforms and picked up by electric lift trucks.

The cupola room is paved with Kreolite Wood Blocks, making the handling of pigs and scrap, easy, safe and sanitary. Two men replace the six formerly required to charge the cupola.

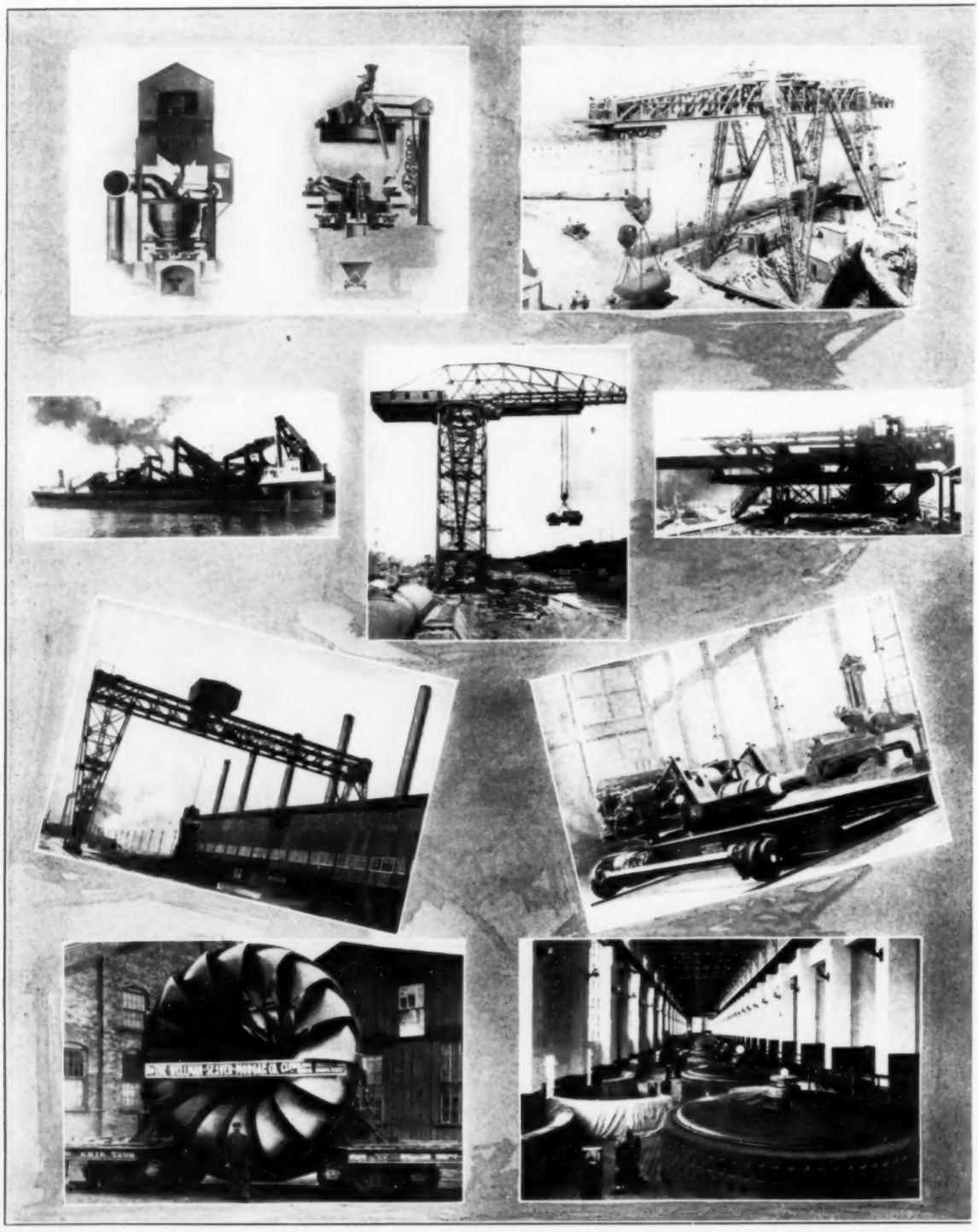
Molten iron is handled in large ladles direct from cupola to molds with electric lift trucks on Kreolite Wood Block truckways.

Molten iron spilled on Kreolite Blocks does not damage floor.

The Jennison-Wright Company

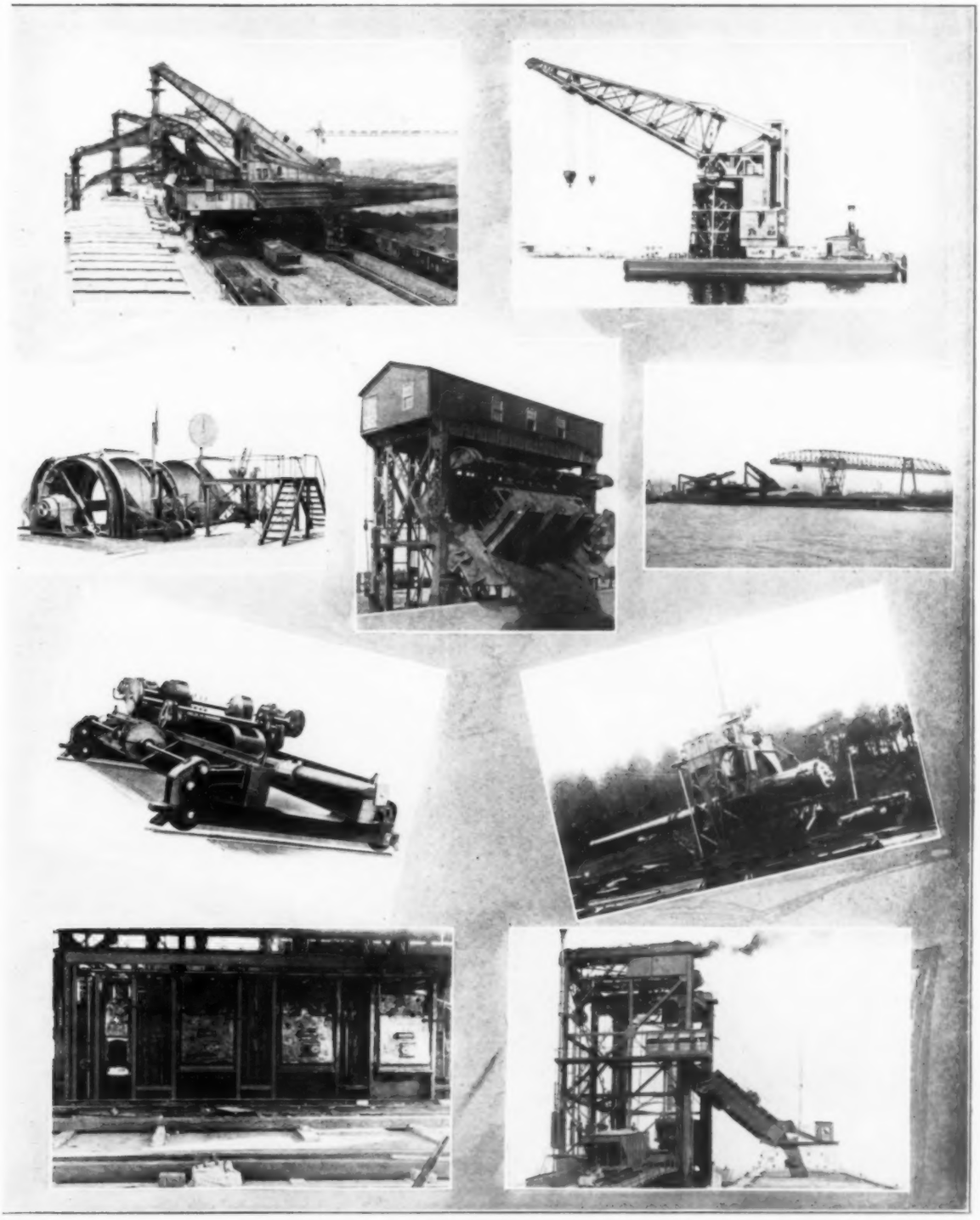
2485 Broadway
Toledo, Ohio

STEEL PLANT EQUIPMENT
COKE OVEN MACHINERY
GAS PRODUCERS
ORE AND COAL HANDLING MACHINERY
SPECIAL CRANES
MINING MACHINERY
HYDRAULIC TURBINES



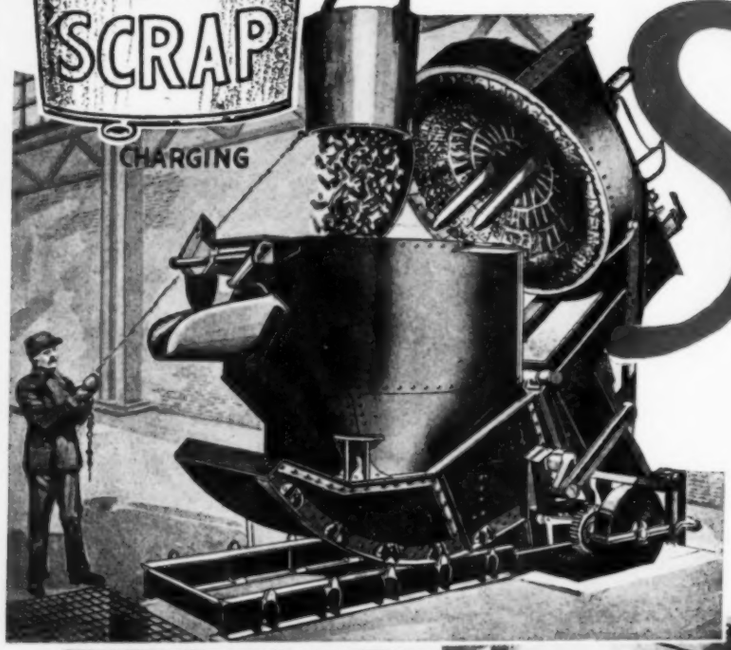
WELLMAN - SEAVER - MORGAN

STEEL PLANT EQUIPMENT
COKE OVEN MACHINERY
GAS PRODUCERS
ORE AND COAL HANDLING MACHINERY
SPECIAL CRANES
MINING MACHINERY
HYDRAULIC TURBINES



COMPANY, CLEVELAND, OHIO

Scrap



The pictures tell the story of SNYDER simplicity, economy and efficiency in electric steel making.

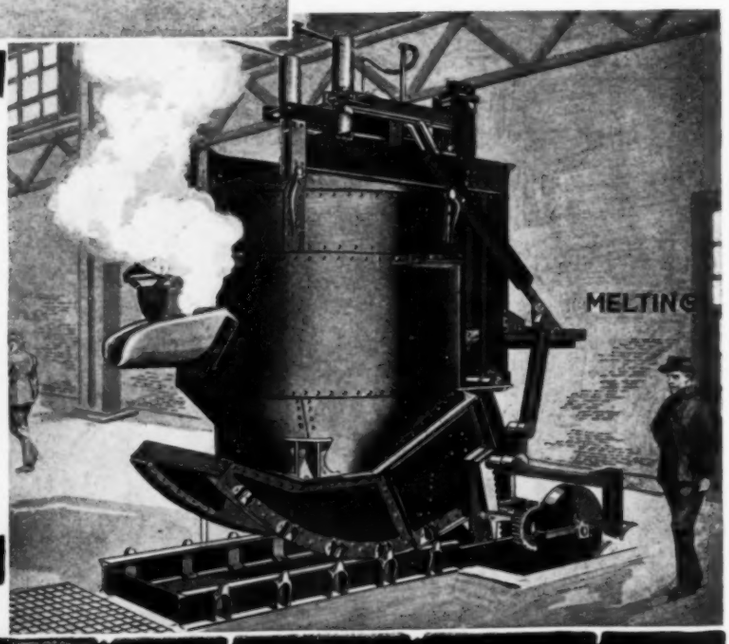
The furnace illustrated is a 3-ton unit but the proportions of materials charged are reduced to the 1-ton basis.

Sizes

Snyder Furnaces are built in a range of sizes from a 50 lb. charge up to a 5 ton charge or greater.

Power

Snyder Furnaces use single or three phase alternating current, as supplied by any central station.



OVER FIFTY IN SUC-

Pile to Ladle

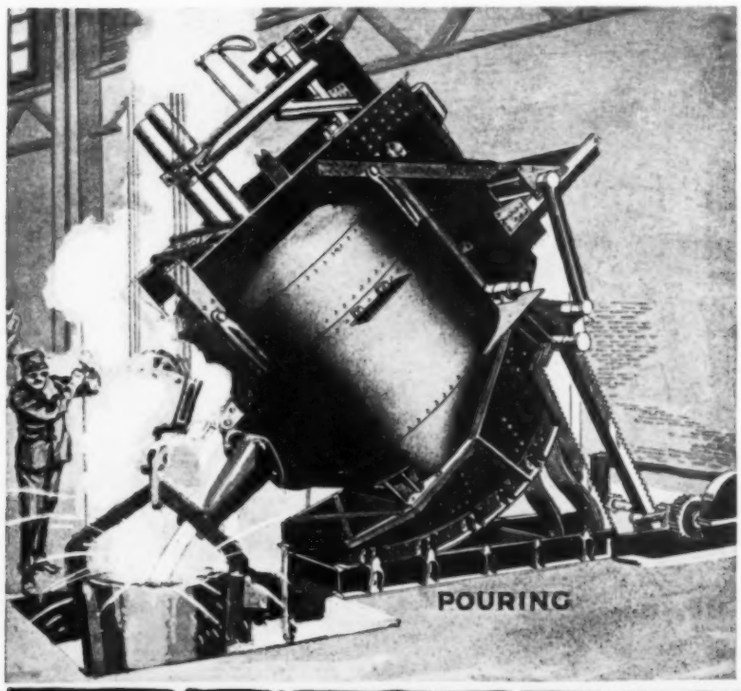
Typical Charge per Ton

Foundry Scrap	600 lbs.
Turnings	500 lbs.
Axle Butts	300 lbs.
Punchings	300 lbs.
Forge Ends	300 lbs.
	2000 lbs. scrap + (Conversion) $10.00 = one ton ordnance quality steel in ladle.

Items of Conversion

Alloys
Electricity
Electrodes
Refractories
Labor

Suitable also for semi-steel malleable iron, gray iron and non-ferrous metals.



Some Snyder Furnace Installations

UNITED STATES

Crucible Steel Castings Co.
Chicago Bearing Metal Co.
Dayton Steel Foundry Co.
S. Fair & Son
Western Crucible Steel Castings Co.
Minneapolis Electric Steel Castings Co.
Gerlinger Steel Castings Co.
Holcomb Steel Co.
American Well and Prospecting Co.
Otis Elevator Co.
Haynes Stellite Co.
Niagara Electric Steel Corporation
Electric Steel Co.
Pelton Steel Co.
New London Ship & Engine Co.
Sterns-Roger Mfg. Co.
Fairbanks Steam Shovel Co.
West Steel Casting Co.
Beaumont Iron Works
Joyce-Cridland Co.
W. K. Henderson Iron Works & Supply Co.
United Alloy Steel Corporation
Standard Steel Castings Co.
Frog Switch & Mfg. Co.
W. J. Oliver Mfg. Co.
Buckeye Traction Ditcher Co.
Hubbard Steel Foundry Co.
Monroe Steel Castings Co.

FOREIGN

Chile Exploration Co.
Davidson Mfg. Co.
Manitoba Steel Foundries
Daimler Steel Co.
Burn & Company
Mitsui & Company

Industrial Electric Furnace Company
53 W. Jackson Blvd., Chicago

CESSFUL OPERATION S

THE PITTSBURGH ELECTRIC FURNACE

has fully demonstrated its superior features in the manufacture of highest quality steels for steel castings, used for ordnance work, and other requirements to meet rigid specifications.

Alloy Steels used in Automobiles, Trucks, Guns, Heavy Forgings, Etc.

For basic or acid operation.

By its rapid and efficient melting and large power input greater economies are effected than are obtained by other steel making methods.

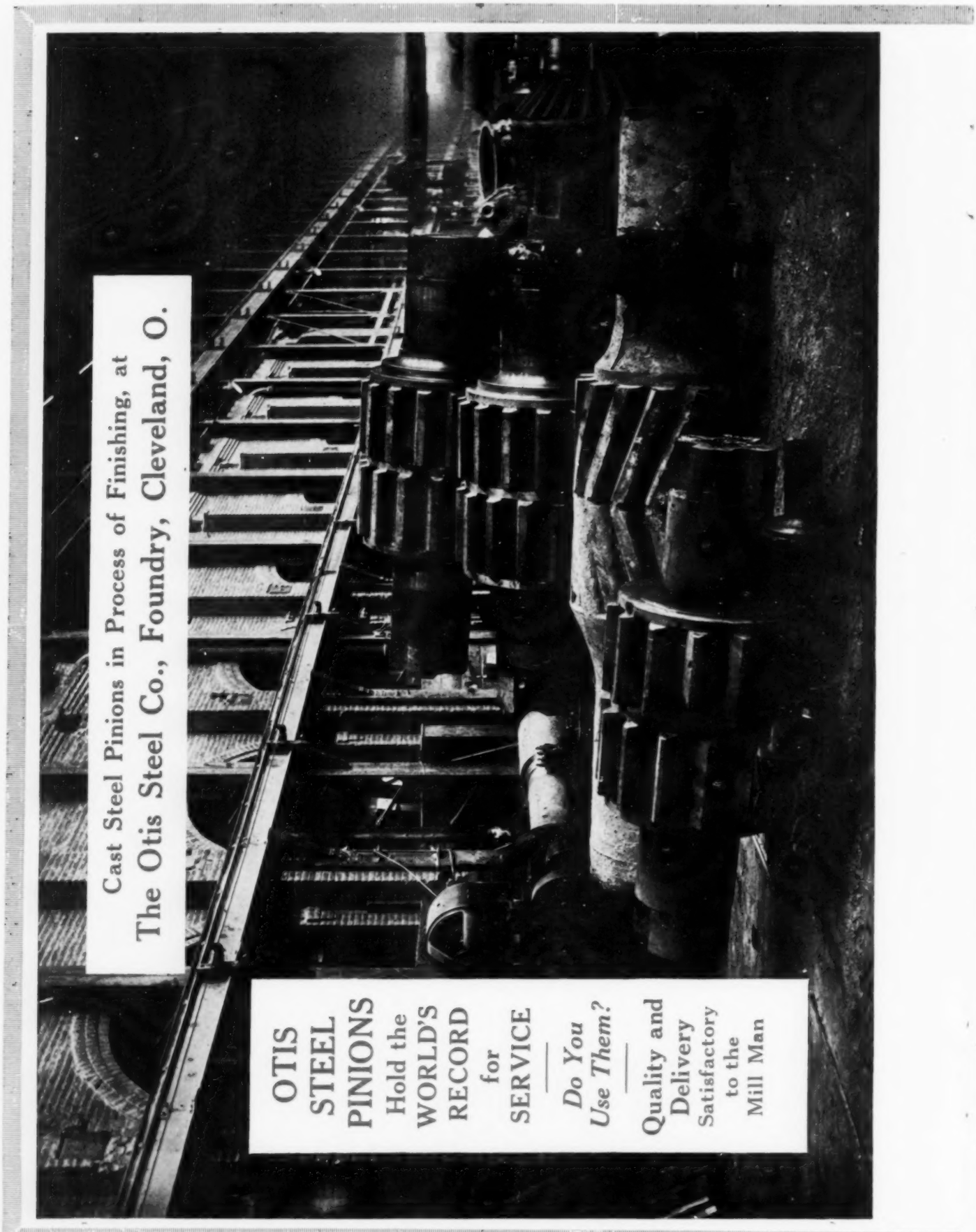
These furnaces are now in operation in a number of plants in Milwaukee and elsewhere.

We invite your inspection of these installations.

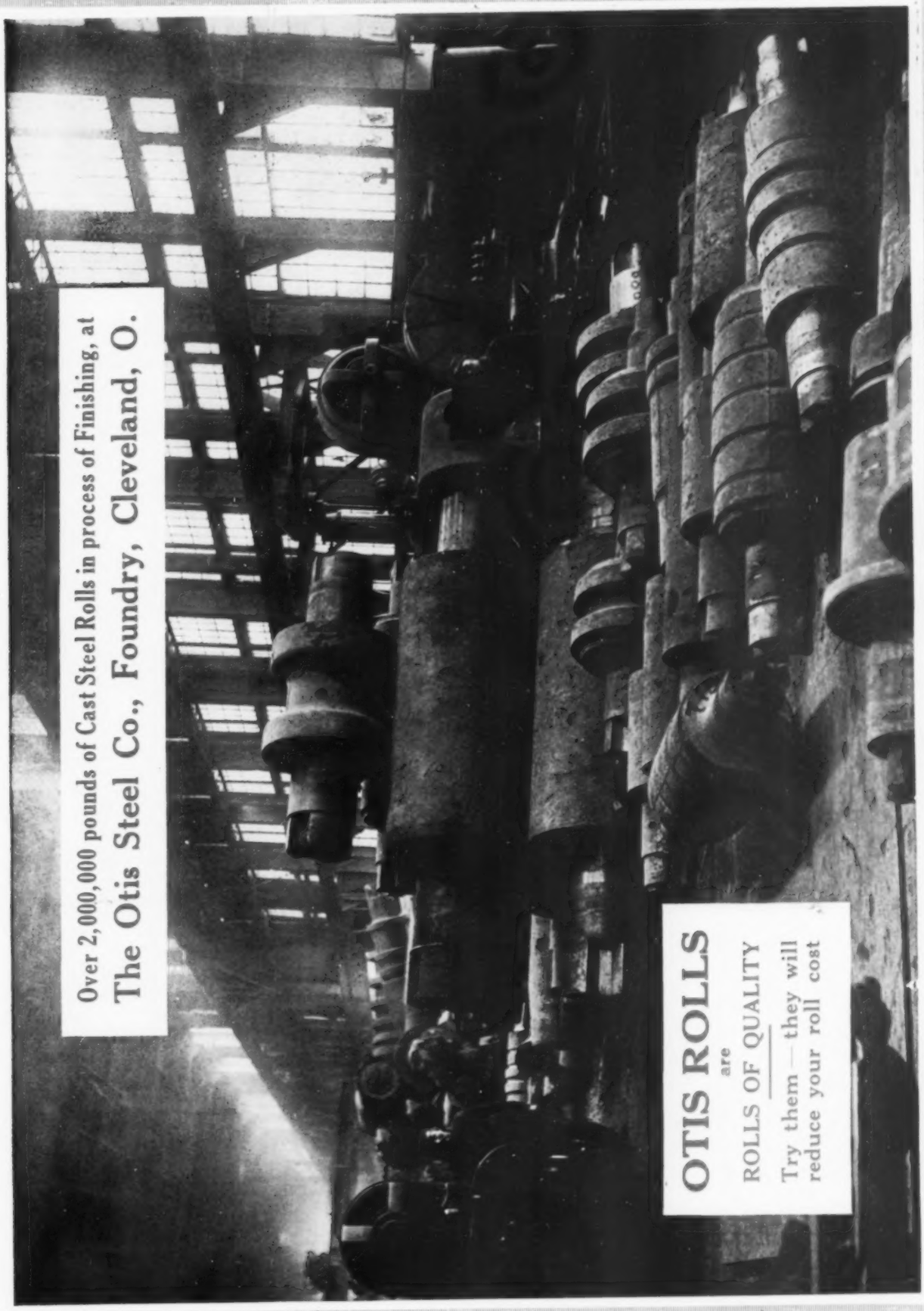
Pittsburgh Furnace Company

707 UNION BANK BLDG.
PITTSBURGH, PA.

215 SYCAMORE STREET
MILWAUKEE, WIS.


Cast Steel Pinions in Process of Finishing, at
The Otis Steel Co., Foundry, Cleveland, O.
OTIS STEEL PINIONS
Hold the WORLD'S RECORD for SERVICE
Do You Use Them?
Quality and Delivery Satisfactory to the Mill Man

Say you saw it in THE IRON TRADE REVIEW


Over 2,000,000 pounds of Cast Steel Rolls in process of Finishing, at
The Otis Steel Co., Foundry, Cleveland, O.
OTIS ROLLS
are
ROLLS OF QUALITY
Try them — they will
reduce your roll cost

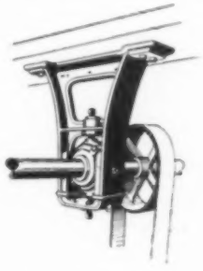
SKF

Say you saw it in THE IRON TRADE REVIEW

BALL BEARINGS

to Speed the Production of Coal Mining Equipment!

Every 3-in. shell fired in France means a consumption of 80 lb. of coal. When artillery bombardments are intense, it is not unusual to fire enough shells at a single point to consume 7000 tons of coal per hour. One recent battle lasting several months consumed more coal than we will produce in all of the mines of Tennessee this year. To build one 8000-ton cargo ship requires 16,000 tons of coal. We plan to build hundreds of these ships this year, so it is evident that this work will demand a large quantity of fuel.

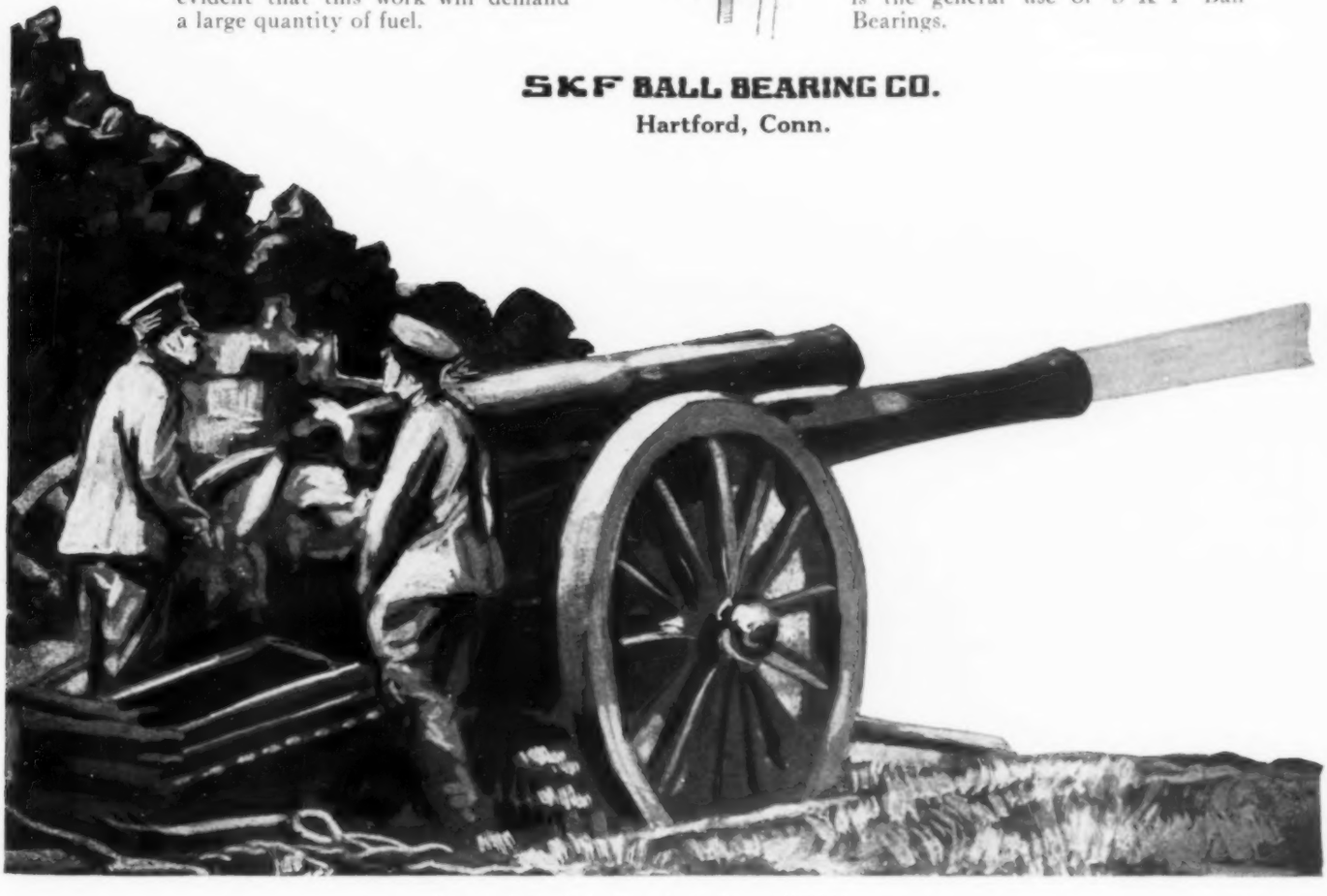


And this means you MUST get better service from your coal-producing EQUIPMENT. You must get from that equipment longer life—more power—greater production—higher speed—maintained accuracy.

You MUST eliminate rapidly wearing plain bearings—bearings that get hot, chatter and cause breakdowns of mining locomotives, coal cutters, fans, portable tools, motors.

And the shortest route to this result is the general use of S K F Ball Bearings.

SKF BALL BEARING CO.
Hartford, Conn.



WORKING FOR UNCLE SAM

RATHBONE, SARD & CO. and DAVIS-BOURNONVILLE APPARATUS

Day Shift Oxy-Acetylene Welders

Night Shift Oxy-Acetylene Welders

Oxy-Acetylene Welders and Government Inspectors at the Rathbone, Sard & Company Plant, Albany, N. Y.

Fully Equipped with Davis-Bournonville Oxy-Acetylene System of Acetylene Generation and Welding Apparatus.

THIS is one of the many plants in the United States fully equipped with the Davis-Bournonville system of Oxy-Acetylene Welding, including acetylene generation on the premises, now engaged on 100 per cent work for Uncle Sam and his army and navy overseas and at home.

There is more Davis-Bournonville oxy-acetylene apparatus than of any other make in the metal-working plants of the country—in the steel mills, foundries, ship yards, munition plants, aeroplane factories, sheet metal working plants, general repair shops, and in the U. S. Navy Yards and with the U. S. Army at home and abroad—because it "leads the world" in range, efficiency, and has the longest successful experience back of it.

Stationary installations, with acetylene and oxygen generating systems or portable outfits, for every requirement, large or small.

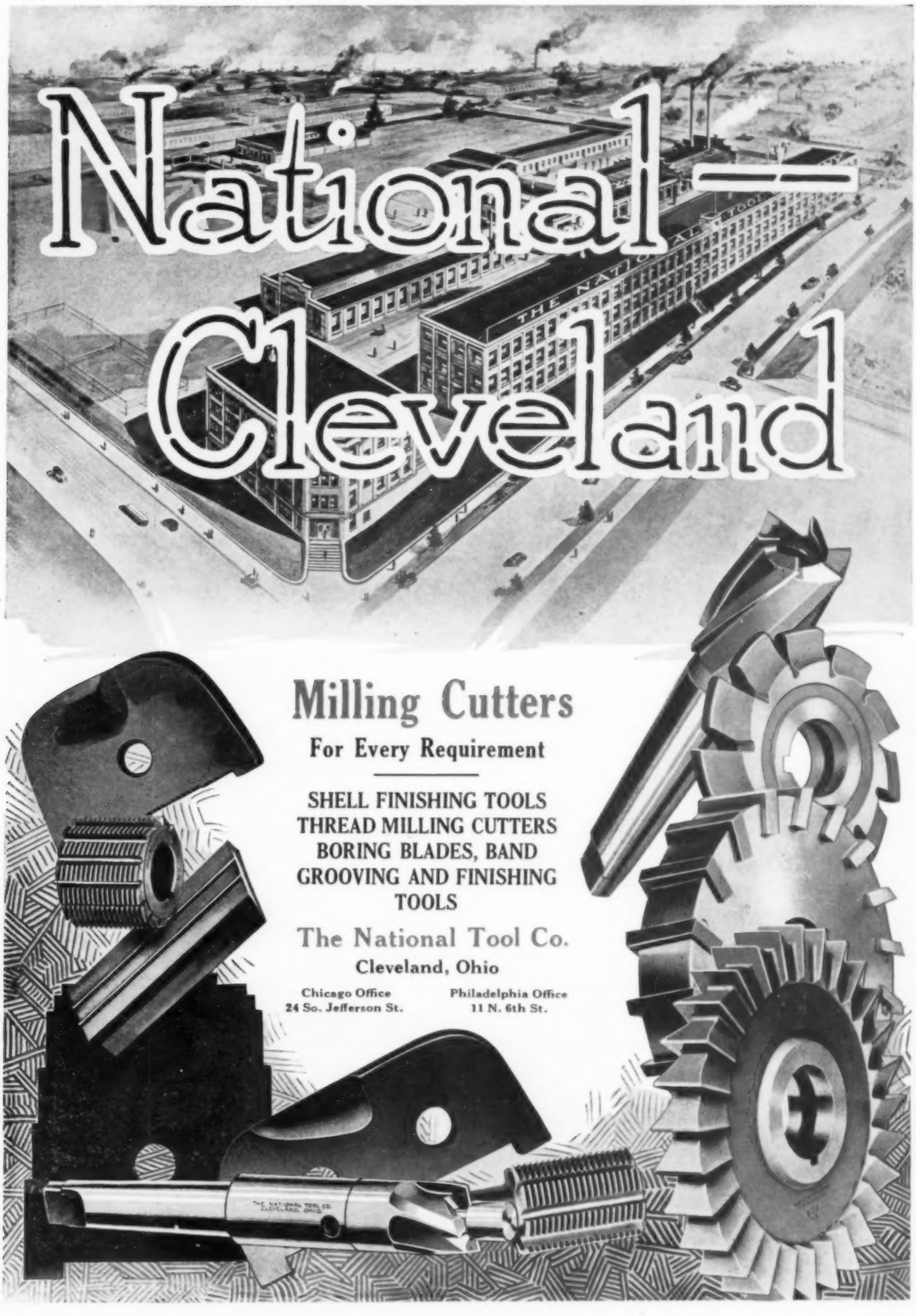
DAVIS-BOURNONVILLE COMPANY

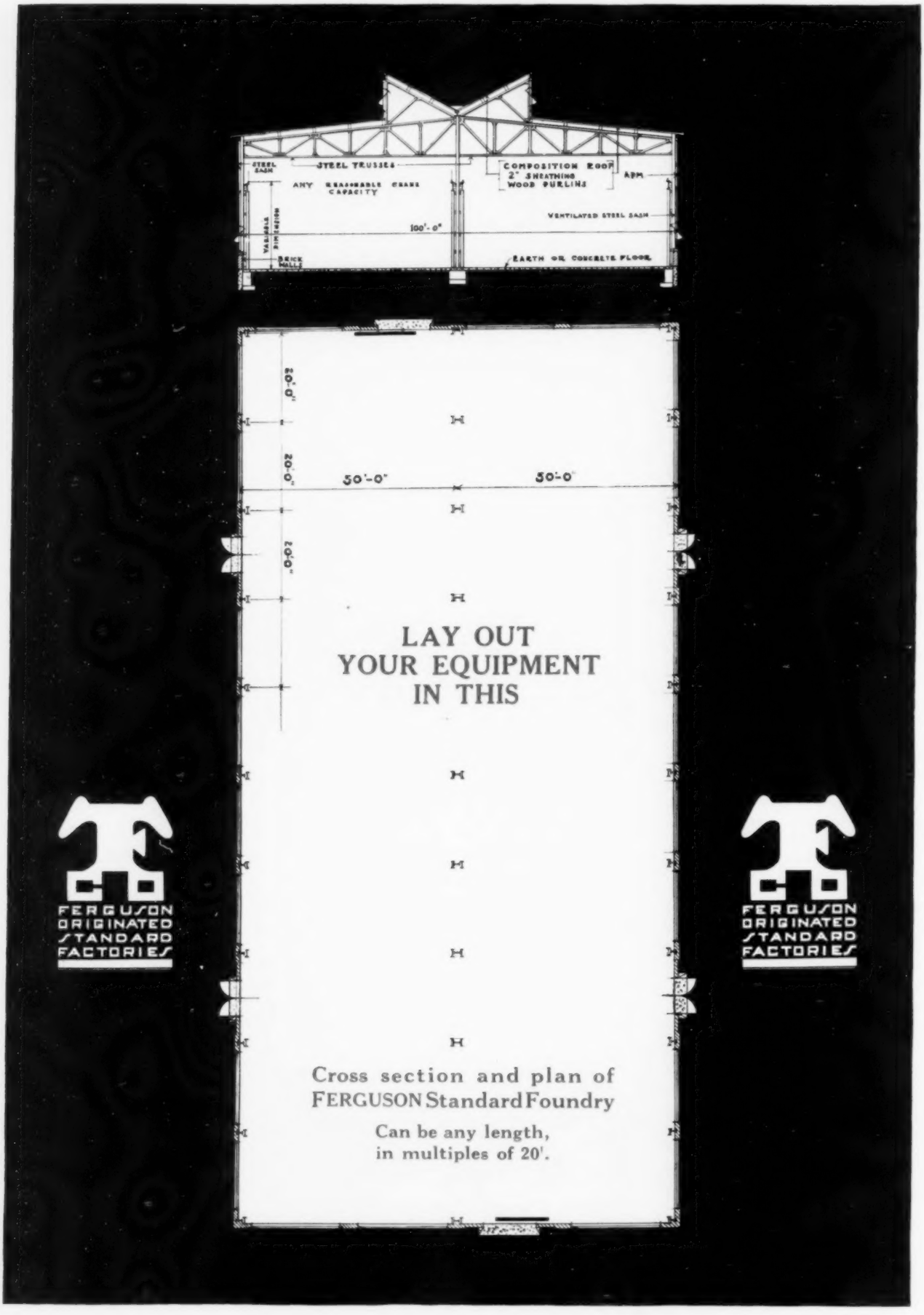
General Offices, Jersey City, N. J.

ATLANTA	CLEVELAND	MINNEAPOLIS	ST. LOUIS
BOSTON	DETROIT	NIAGARA FALLS	SAN FRANCISCO
CHICAGO	JERSEY CITY	PHILADELPHIA	SEATTLE
CINCINNATI	LOS ANGELES	PITTSBURGH	WASHINGTON, D.C.

OXY-ACETYLENE WELDING DAVIS APPARATUS DAVIS-BOURNONVILLE CO. N.Y.

Factories at Jersey City, N. J., Elkhart, Ind., and Niagara Falls, Ontario.


National—
Cleveland
THE NATIONAL TOOL
Milling Cutters
For Every Requirement
SHELL FINISHING TOOLS
THREAD MILLING CUTTERS
BORING BLADES, BAND
GROOVING AND FINISHING
TOOLS
The National Tool Co.
Cleveland, Ohio
Chicago Office
24 So. Jefferson St.
Philadelphia Office
11 N. 6th St.


STEEL SASH
STEEL TRUSSES
ANY REASONABLE CRANE CAPACITY
COMPOSITION ROOF
2" SHEATHING
WOOD PURLINS
APPX.
VENTILATED STEEL SASH
100'-0"
BRICK WALLS
EARTH OR CONCRETE FLOOR
20'-0"
20'-0"
20'-0"
50'-0"
50'-0"
LAY OUT
YOUR EQUIPMENT
IN THIS
FERGUSON
ORIGINATED
STANDARD
FACTORIES
FERGUSON
ORIGINATED
STANDARD
FACTORIES
Cross section and plan of
FERGUSON Standard Foundry
Can be any length,
in multiples of 20'.

1 THE FERGUSON COMPANY, of Cleveland, subject to prior sale and the necessary priority arrangements, will deliver to you, erected on your property, ready for useful occupancy, any reasonable amount of *FERGUSON No. 3 Standard Foundry Building in Sixty (60) Working Days.* A plan and cross section of this building are shown on the opposite page.

2 THE FERGUSON COMPANY owns essential materials outright and, subject to prior sale; can erect for you complete, ready for useful occupancy, any reasonable amount of *FERGUSON Standard Sawtooth Buildings for Pattern and Machine Shops in Thirty Working Days.*

3 There are other types of FERGUSON Standard Buildings. No. 1 is 60' wide, with one row of columns, and without a monitor. It makes a good pattern or machine shop. No. 2 is 90' wide with two rows of columns; a monitor; and provision for a traveling crane. It makes a good light foundry or machine shop. *These Buildings can be had in Thirty Working Days.*

4 If no FERGUSON Standard Buildings are adequate for your purpose, the FERGUSON Engineering Department will design special structures for you, or assist your own engineering department if you are short-handed now. *The FERGUSON Construction Department is ready to build and equip either standard or special structures in record time.*

5 On account of the necessity for economy in building materials, especially structural steel, *FERGUSON Engineers are devoting particular attention to additions and alterations to existing plants and equipment,* in order to secure increased production at a minimum cost for new materials and labor. This work is all done under the FERGUSON Engineering Contract, copy of which will be sent on request.

6 *All FERGUSON men, equipment and standard buildings are available only for war or railroad or other essential work.*

FERGUSON ORIGINATED STANDARD FACTORIES

FERGUSON ORIGINATED STANDARD FACTORIES

Harold Ferguson
President

The Ferguson Company

Engineers and Builders

6523 Euclid Ave. CLEVELAND, OHIO Rosedale 6854

Ferguson
STANDARD SHOPS AND FACTORIES

Napier Saw Works Opens Chicago Branch

OWING to the enormous increase in their central western business, it has become necessary to establish a western distributing point for the Napier Products.

This Chicago Branch will carry a large stock of Hack Saw Blades, metal cutting Band Saws, Band Saw Machines and Hack Saw Machines.

This will enable the Napier Saw Works to make shipments more promptly to western points.

The Chicago Branch maintains a large brazing department to braze Band Saws for western customers, thus emphasizing the service and efficiency of the Napier Saw Works as metal cutting specialists.

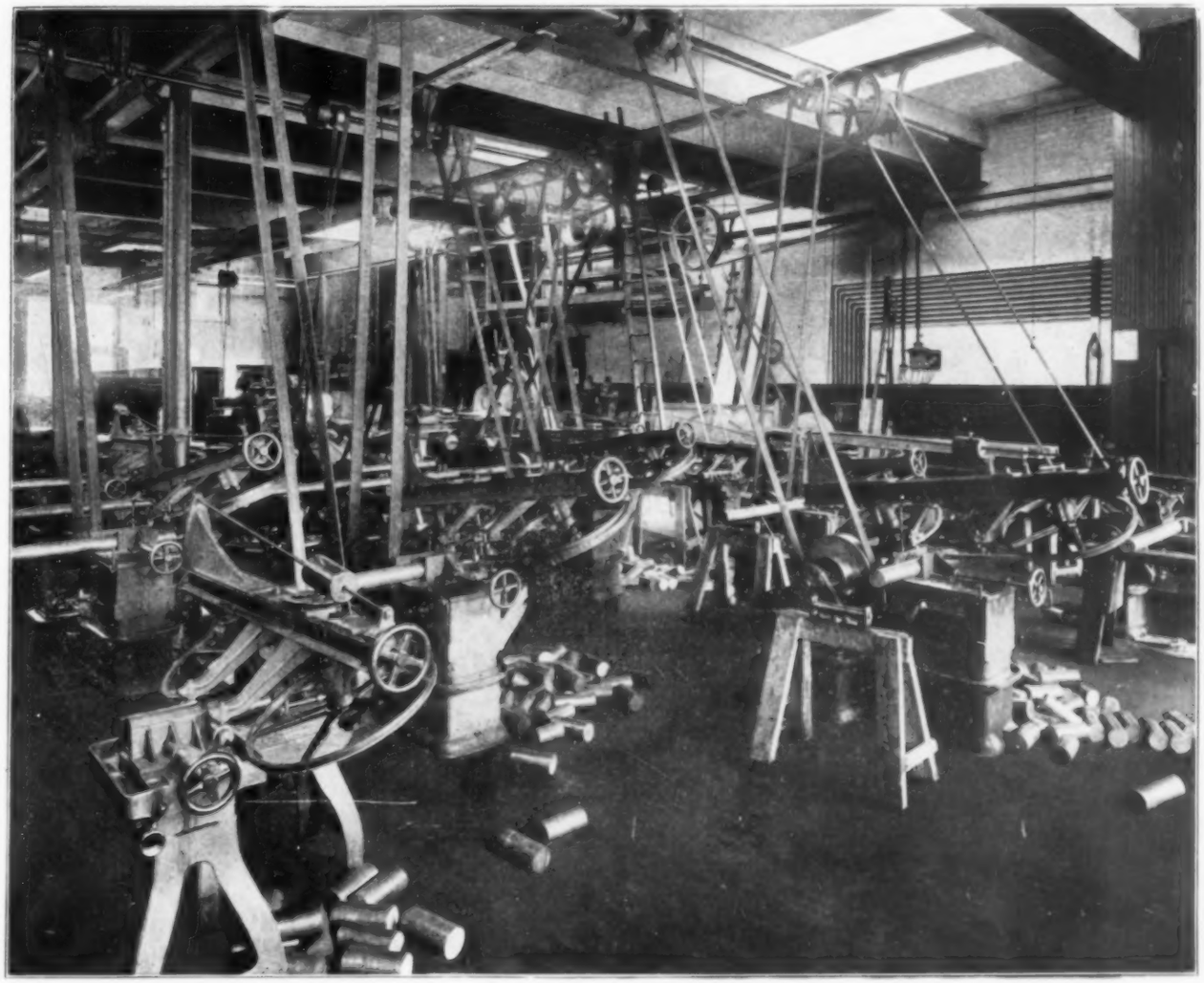
The Chicago Branch will be in charge of Mr. J. H. Green, the present Sales Manager.

Mr. Green will be assisted by a group of salesmen in the giving of 100% service to the trade.

These men are more than salesmen. They are service men working in the interests not only of the dealers, but the direct trade as well.

Napier Saw Works, Inc.
6 Napier Street
Springfield, - Massachusetts

17



15 Napier Band Saw Machines

Cutting 4-inch Solid Stock for Liberty Motors

THIS typifies the efficiency of the Napier Band Saw Machine. It also illustrates the up-to-the-minute manufacturer's appreciation of its capabilities.

Where a real job of cutting at top speed is necessary, Napier Band Saw Machines are as necessary.

THE Napier Band Saw Machine is a heavy duty tool. The stroke is continuous; no lost motion. It minimizes waste and is built for accuracy and top-notch speed, whether the stock be large or small.

Napier Saw Works, Inc. is back of both the machine and the blade.

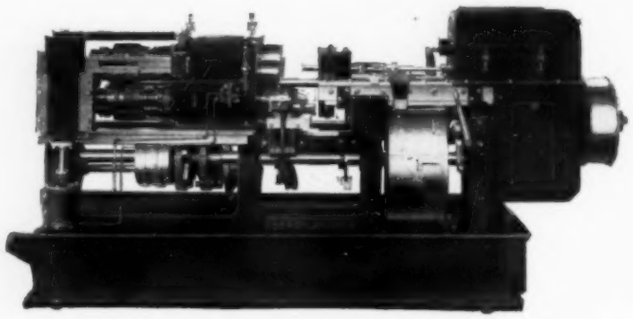
WRITE FOR DESCRIPTIVE CIRCULAR

Napier Products

Band Saw Machines **Hack Saw Machines**
Band Saws **Hack Saws**

Napier Saw Works, Inc., No. 6 Napier St., Springfield, Mass.

17a



A New "New Britain" Automatic

Features are incorporated in this new model which render it capable of handling certain classes of chucked work (castings, forgings, and second-operation bar jobs) with close accuracy and marked increase in production.

The work is held in and rotated by the spindles (six in number), the tools being fixed in the tool slide.

The use of cross-slide tools for forming, necking, cutting off, etc., is thus made possible.

Work Rotating Type Multiple Spindle Automatic Chucking Machine

Machine is regularly equipped with air-operated chucking mechanism, provided with cylinder of large size to insure successful operation on low air pressure. This device makes chucking a simpler, easier, and quicker operation, resulting in accelerated production—particularly when the operations are short.

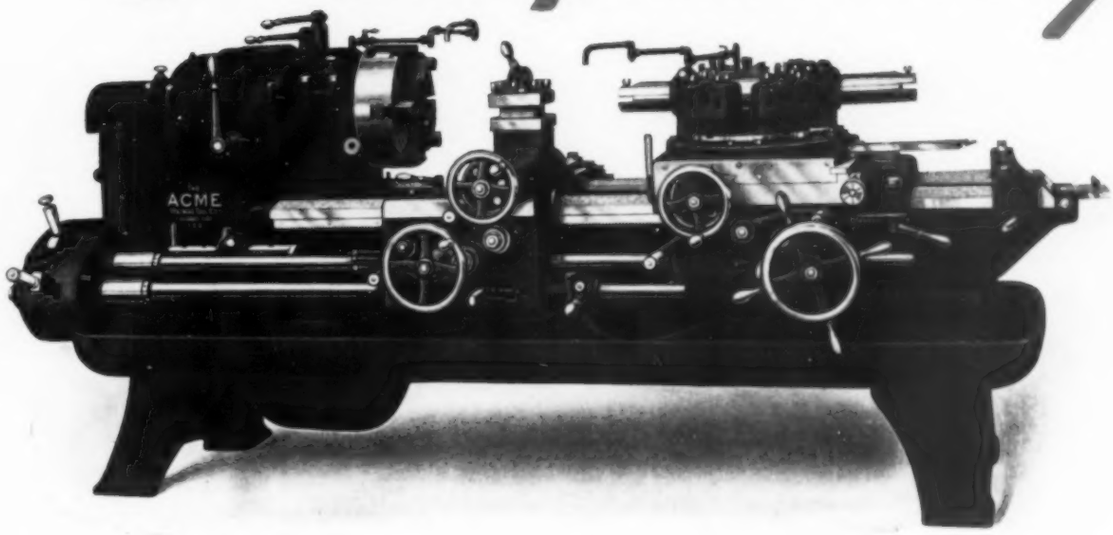
Second operation work may be held in chucks, collets, or on thread arbors and is finished accurately concentric with first operation.

Bulletin No. 956 describes machine in detail
giving illustrations of work with productions.
Send for it to-day.

The New Britain Machine Company
New Britain, Conn., U.S.A.

NEW BRITAIN AUTOMATICS

CINCINNATI *Convenience* —ACME *Adaptability*



Cincinnati-Acme Screw Machines and Turret Lathes have won favor in the largest shops of Our Country because of their **convenience** and **adaptability.**

Our machines are not only convenient to operate and adaptable to all classes of bar and chucking work, but are built to stand the gaff.

Unless a machine tool has the ability to stand constant service, and stand for a little abuse mixed in with daily use, it cannot be a profitable investment. The time and cost of repairs, maintenance and overhauling will quickly absorb whatever profit it produces.

As our line covers both the flat and hexagon turret type machine, we can offer the right machines for your requirements.

Before making your next purchase investigate Cincinnati Acme machines. Complete details gladly sent on request.

Look us up at the Foundry and Machine Exhibit—Milwaukee, Oct. 7-11

The Acme Machine Tool Company

CINCINNATI OHIO, U. S. A.

GK

ENGINE LATHES

We build a complete line of *Engine Lathes*, from 16" to 30" inclusive.
Our 16" and 18" Lathes are built with three styles of Headstock:

Four Step Cone Single Back Gear.
Three Step Cone Friction Double Back Gear.
Geared Head, Single Pulley Drive.

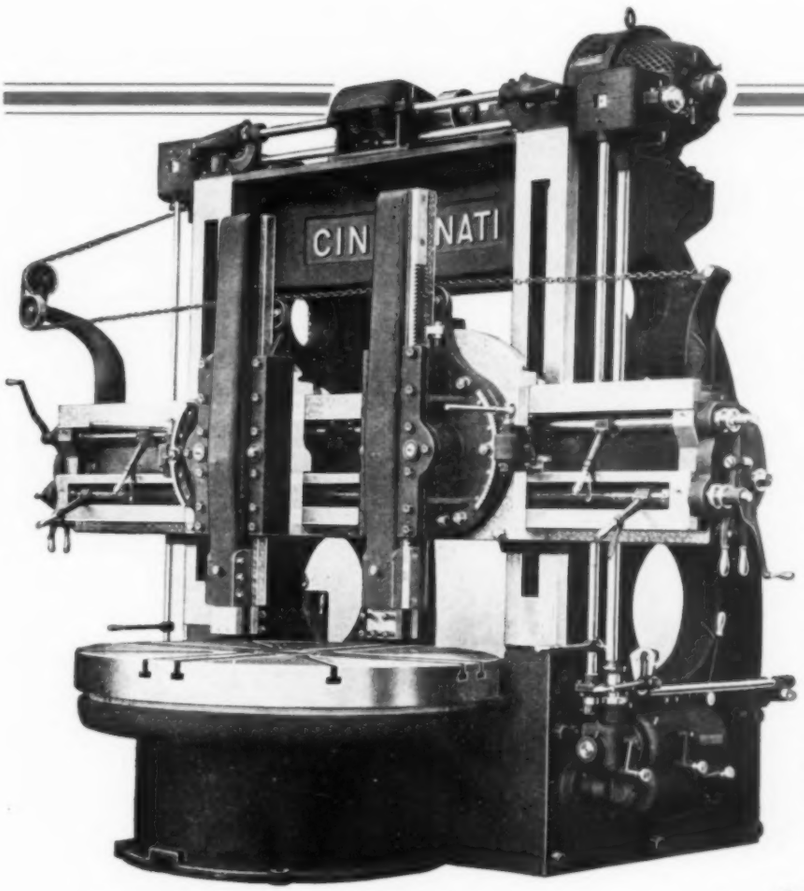
Our 20", 24" and 30" Lathes are built in two styles.
Three Step Cone Friction Double Back Gear.
Geared Head, Single Pulley Drive.
All sizes of machines built with *Quick Change Mechanism.*

Write for Catalog

The Greaves-Klusman Tool Co.

CINCINNATI, OHIO, U. S. A.

Say you saw it in THE IRON TRADE REVIEW



Cincinnati Boring Mill

This Boring and Turning Mill has smashed all past records in heavy-duty production. With ease and rapidity this big machine performs the severe work of boring locomotive cylinders and driving wheels, and the ponderous operations required in ammunition factories.

It is a powerful, purposeful machine, widely adaptable, entirely accurate and endlessly durable. It is made in sizes up to 12 feet.

Cincinnati Planers

Designed for speed, accuracy and adaptability. Reinforced Arch; Patent Rail Elevating Device; Micrometer Collars for Horizontal or Vertical Feed; Ball Bearings on Down Feed Screws; Simplex Feed Gear; Adjustable Taper Gibs thruout; Housings Keyed and Doweled to Bed.

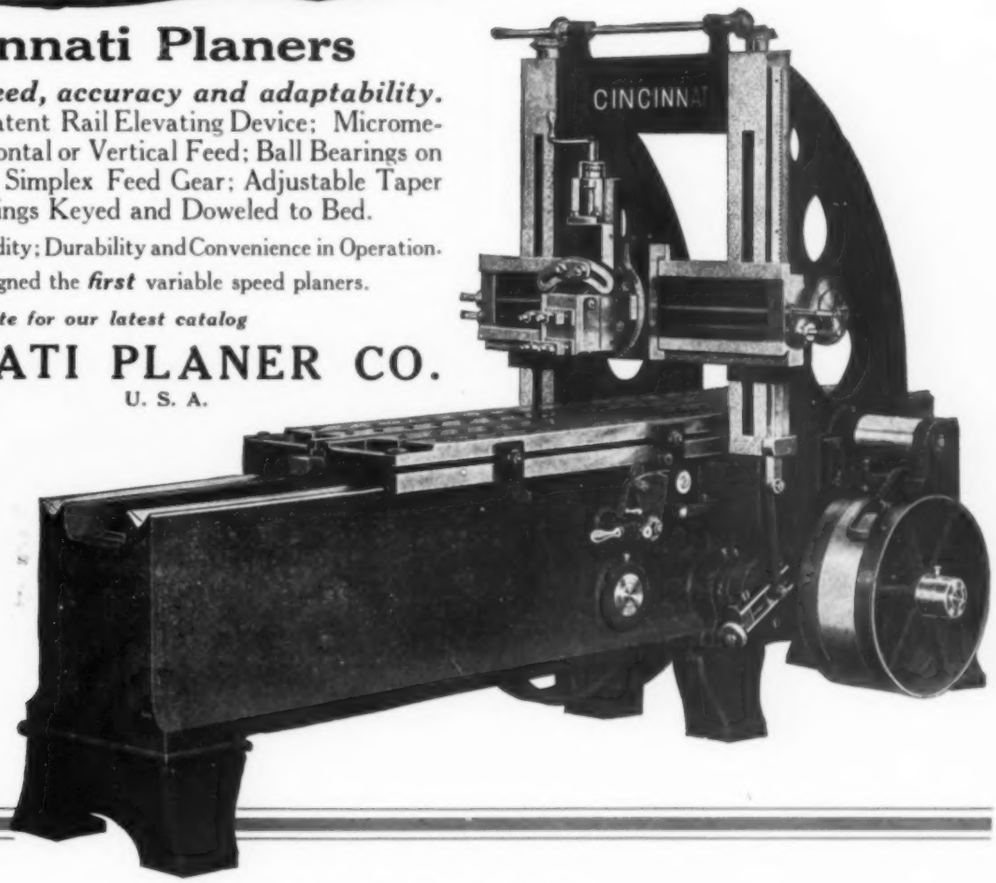
Extreme Strength; Rigidity; Durability and Convenience in Operation.

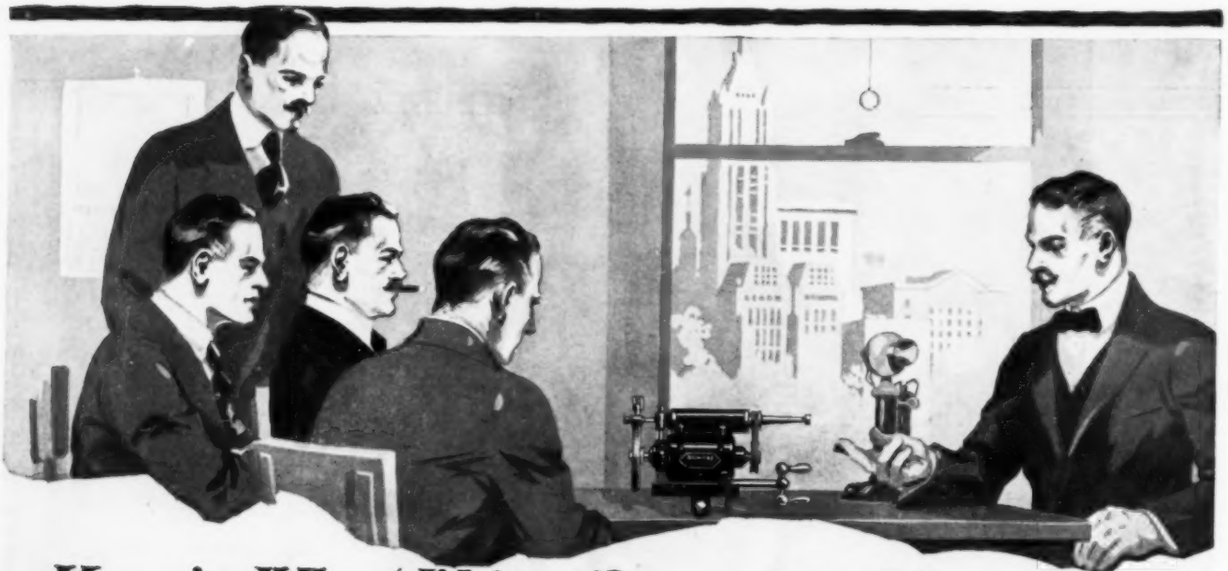
We originated and designed the ***first*** variable speed planers.

Write for our latest catalog

CINCINNATI PLANER CO.

CINCINNATI, OHIO U. S. A.





Here's What We've Been Looking For-

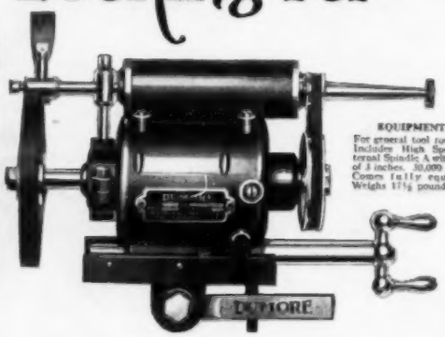
"I've called you in to see our latest purchase—a DUMORE high-speed grinder. You all know that our tool room has been the weakest spot in the whole organization, as our troubles in die and gauge making show, but this tool is our remedy. Now I am confident we can not only obtain correct standards in our shop but we can also eliminate waste of time and labor. We need the DUMORE in our business."

Make the standards of your tool-room right. The DUMORE insures accuracy because its high speed gives wheels the correct cutting speed and its perfect running balance eliminates vibration. It is portable, weighs but seventeen pounds, and can be used from one end of the shop to the other. Chatter-marks, taper or bell-mouth are unknown in the shop equipped with the DUMORE.

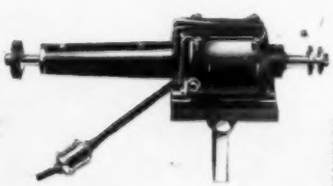
If you haven't a DUMORE grinder already at work, your shop is not as efficient as it might be. Have your supply dealer show you this tool or ask us for literature and prices. Write today, and remember the name—DUMORE.

WISCONSIN ELECTRIC CO.

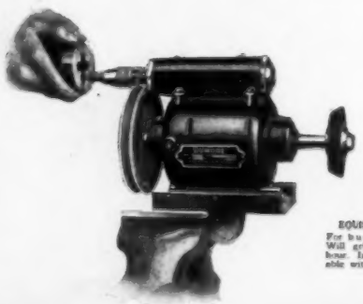
3504 16th Street RACINE, WIS.



EQUIPMENT A
For general tool room use. Includes High Speed Internal Spindle A with reach of 3 inches. 50,000 R.P.M. Comes fully equipped. Weighs 17½ pounds.

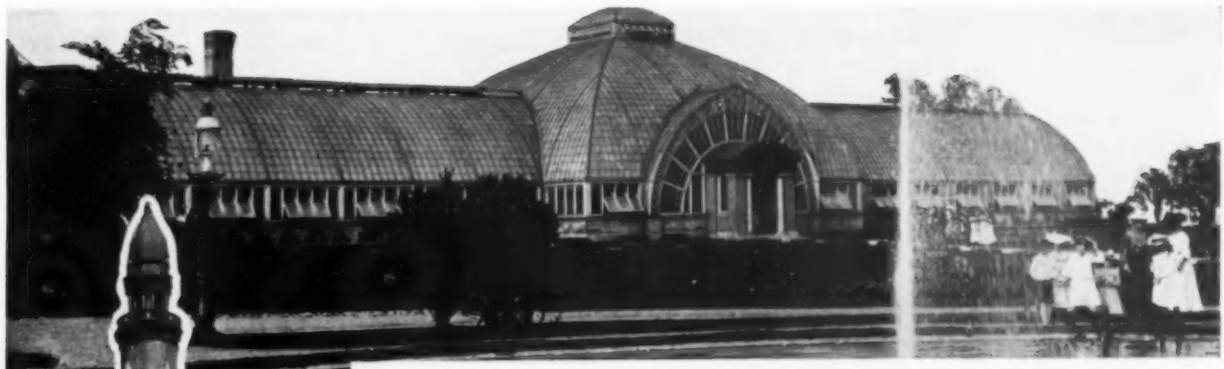


EQUIPMENT B
For deep internal work. Extension arm has 10-inch reach. 10,000 R.P.M. Arm interchangeable with internal spindle on Equipment A.



EQUIPMENT C
For button dies. Will grind 20 on base. Interchangeable with A and B.

DUMORE HIGH SPEED GRINDERS



Milwaukee is 130 Per Cent Patriotic

MILWAUKEE is true American! Its record is more than 100 per cent. It is not only IN the United States but it is OF the United States. Those who expected but luke-warm interest in the nation's struggle against German militarism from the Wisconsin metropolis with its Teutonic population and ancestry have been disappointed. That city, stigmatized repeatedly by the glib-tongued but ill-informed and unthinking, has shown a magnificent spirit of loyalty, unsurpassed anywhere in this country. Milwaukee has demonstrated that its heart is sound; that its heart is in the war—on the American side. This is surprising only to those who did not understand Milwaukee and the character of her citizenship.

A genuine test of the loyalty of any city is the manner in which it has responded to the call of the government for aid in carrying on the war. Applying this test to Milwaukee it is found that it has exceeded by 30 per cent the financial mark set for it by the government. Its voluntary enlistments in the army are far above the average for cities of its population, aside from calls by the draft. Its manufacturing plants are now devoted almost exclusively to the production of war material; they are turning out nearly 100 different essentials of a military character.

And speaking of its citizenship, 96,000 of its 98,000 families have pledged their adherence to all the government's regulations for the conservation of food.

Milwaukee has attained a record in this war which should forever settle any doubt in the mind of any man that it is aggressively and uncompromisingly American. Patriotism permeates it; it is fighting as though its life and the life of the nation depended on it. Its factories are humming day and night; its people talk and work for victory, the loyalty of its labor being especially significant.

All honor to Milwaukee. Its patriotism is making it famous.

Typical Glimpses of Milwaukee

BUSINESS CENTER
WISCONSIN ST., WEST FROM HOTEL PFISTER
LIBRARY AND MUSEUM
CHICAGO, MILWAUKEE & ST. PAUL RY. DEPOT
COURT OF HONOR, GRAND AV.
COURT HOUSE
MILWAUKEE ATHLETIC CLUB

Patriotic crowd at industrial rally in Liberty loan drive.

Industrial Power Consecrated to Country

BY G. H. MANLOVE

PATRIOTISM, stalwart and spirited, is sweeping the city of Milwaukee. The city is demonstrating in every way that it is 100 per cent American. It is keenly awake to the issues of the war; it has been stirred as never before; it is straining every nerve to demonstrate to the nation that it is ready to give its best to the cause of the country. Every plan of the government for raising funds, for promoting production of war material, for raising armies has been the signal for Milwaukee to do more than its share.

If a transverse slice of the western front, proportioned to the size of the city, had been set aside and Milwaukee had been told to supply the men, money, clothing, equipment, munitions, transport and a score of other necessities for the defense of that sector and the offensive against the enemy, the city could not have done more than it has done and is doing now.

Milwaukee has gone "over the top" with true American spirit. It has done more in every instance than has been asked and the total of its financial aid is close to 30 per cent in excess of its allotment. Never content with performing just the work set for it, Milwaukee has gone far beyond the goal in every campaign. These things can be measured and set down; they are concrete and understandable. But Milwaukee has aided in another way, and will continue to aid by devoting its great industrial energies to the task of supplying American and allied forces equipment and munitions necessary to a successful war.

When the government wants a product that can be supplied by an existing industry, the contract is taken at once. If added equipment is necessary it is provided, additional shops are built, men or women are obtained, and the stream of supplies starts. In the metal and leather trades this is a natural adaptation, but the process of supplying the armies has gone further and woodworking plants, candymakers and bakers have done their part. When guns were needed Milwaukee citizens extended credit to finance a great plant which has been turned over to the government. Guns are being made where nothing of the kind ever was produced before. Not only was the plant built by Milwaukee to aid

Milwaukee's Americanism

	Allotment	*Subscribed*	*Excess*
First Liberty Loan	$14,000,000	$17,000,000	$ 3,000,000
Second Liberty Loan	25,000,000	33,000,000	8,000,000
Third Liberty Loan	14,800,000	23,550,000	8,750,000
Red Cross War Fund	500,000	780,000	280,000
Red Cross Memberships	100,000	162,000	62,000
Y. M. C. A. and Y. W. C. A.	165,000	187,000	22,000
K. of C. War Fund	100,000	133,000	33,000
	$54,665,000	$74,812,000	$20,147,000

Food pledges from 96,000 of approximately 98,000 families.

the government, but it was built in about 60 days and the schedule laid down by the government was anticipated by six months. Patriotism with money, shown by lending or giving to the government or to organizations helping the soldiers, and in financing industry for the manufacture of the necessities of war, is one side of the picture. There is another. Behind this patriotism of dollars is the patriotism of the heart, shown especially by the workers, without whose aid the other effort would come to naught. No strike or industrial disturbance has checked war production in the past 17 months.

This result has been the outcome of two factors. First is the genuine patriotism of the workers. Second is the fair-minded attitude of the employers, who have been willing to go halfway and meet conditions that demanded larger pay by granting it. This has been done without resort to forceful means and its result has been to promote harmony.

Recently the metal trades voluntarily adopted the basic 8-hour day, paying additional wages for all time over that period. In return for this the workers continue to work the same length of time as before, and production is kept up, while the worker is paid more than ever before

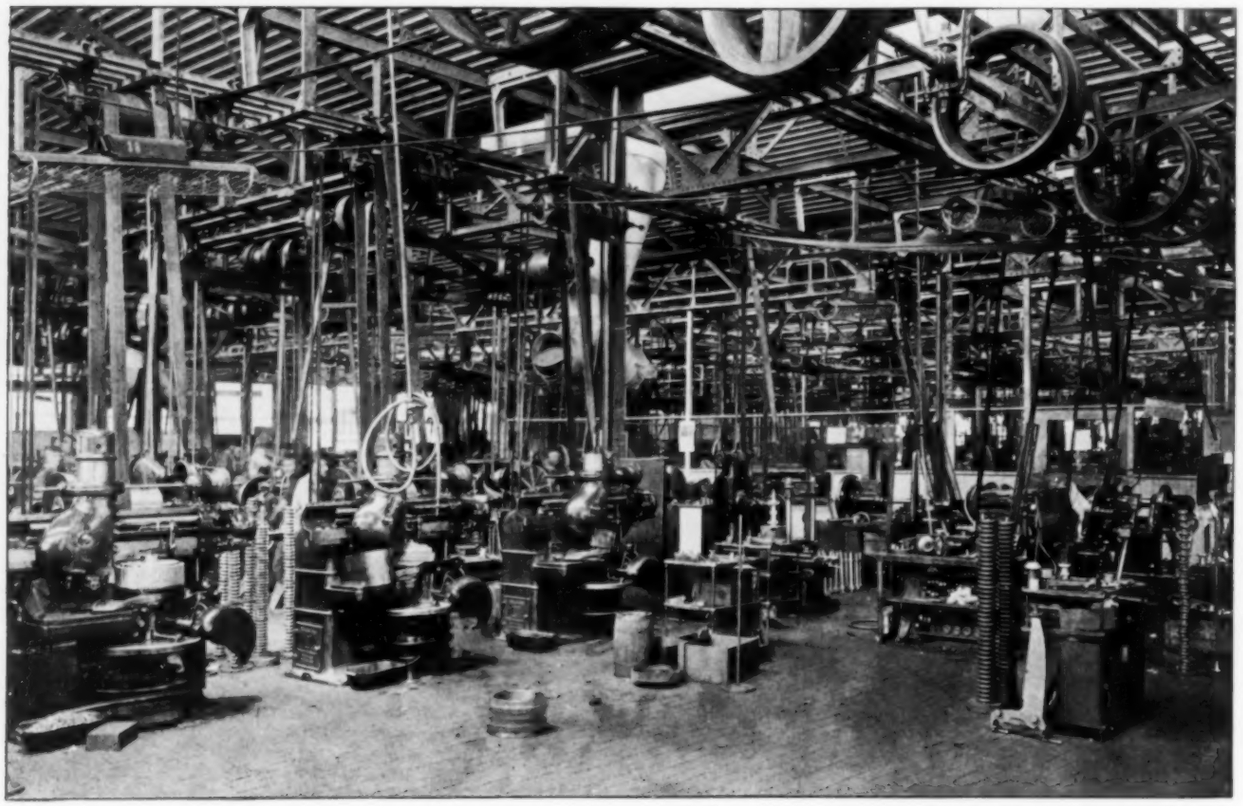
Milwaukee forms a "close-up" of Wisconsin, in the motion picture parlance. What the metropolis has done in a way to be seen easily, because compressed into small space, the state has done equally well in a broader way. Wisconsin created the first state council of defense. It was the first to pass legislation providing aid for soldiers' dependents. It was the first state to use election machinery, at local expense, for registration of men subject to draft. It sent its national guard to camp fully equipped for service at state expense. Its voluntary enlistments exceeded those in Ohio, Indiana, Illinois, Minnesota, and other states of large population. It exceeded its quota under the draft by 1814 men, who presented themselves voluntarily for induction into the service. Its men in the trenches April 15, 1918, exceeded the number from any other state. It was the first state to file in Washington its complete registration report, beating the District of Columbia by four hours.

Milwaukee Goes All the Way

Having provided the men, Milwaukee considered its task was to provide clothing, equipment and transportation for them. So it surveyed its resources. Possessing many metal-working, clothing and leather establishments, its field was wide, and all its resources were offered to the government.

Co-operation has been the keynote. The manufacturer needing castings has been able to obtain them from foundries at home. Plenty of machine shop capacities are at his disposal to handle an excess of work or work that is impossible with his equipment. One has been ready to help the other, for the welfare of all.

It is difficult to imagine a department in war preparation to which some contribution is not being made by Milwaukee. Its gray iron, steel, malleable and brass foundries are shipping parts to many other cities to be included in the manufacture of machinery, guns, trucks and ship engines. It is making underwear, hosiery, shoes, uniforms, helmets, puttees, gloves and shirts for the soldiers. Harness and saddles, leather goods of various kinds, trunks and bags for officers come from the leather works. Engines for cargo ships and destroyers, hollow shafting for driving the propellers, electric control for many ship operations, depth bombs, naval guns and their shells, fuse parts, cranes for shipyards, compasses, range-finders, and refrigerating machinery for ships, for cantonments,



MAKING MILLING MACHINES AT PLANT OF KEMPSMITH MFG. CO. FOR MUNITION PLANT USE.

and for warehouses in France give an idea of the contributions of this inland city. Scout boats for chasing submarines are manufactured complete. Starters for airplanes, propellers, compasses, motors, fuselage and other parts are among the contributions to aerial warfare. Motorcycles, Liberty motors for trucks and truck frames, aid in the transport service. Shells are being made by many plants and loaded with explosives in others. These explosives may be from by-products extracted from coal tar in a great plant built since the opening of the war. The timing device also is made in Milwaukee. Then there are trench bombs, aerial drop bombs, hand and rifle grenades, phosphorus grenades, cartridge cases and clips, tin fuse containers, booster casings, gun mounts, gas projectiles and trench pumps, while gasoline engines are being made for dirigibles. Even insignia to designate officers are made to go with the clothing.

MACHINING TROLLEY PARTS FOR CRANES FOR MUNITION PLANTS AND SHIPYARDS.

List Constantly Growing

This catalog of the various kinds of war equipment being made in Milwaukee is far from complete. It is an ever-growing list and no man can keep pace with its development. As old contracts for the usual products of peace time have been completed war work has been taken on gradually until it has supplanted other activities. The change sometimes has been a wide divergence from the ordinary line of manufacture, while in others it has meant no alternation, except to concentrate on certain specialties and to increase output. Thus, machine tools made by such concerns as Kearney & Trecker and the Kempsmith Mfg. Co., have been useful to other manufacturers in doing their part in war work and they have simply redoubled their efforts without changing the character of their output, to supply the huge demand. The large crane builders, Pawling & Harnischfeger, and the Milwaukee Electric Crane & Mfg. Co., found no necessity for building anything but cranes, since shipyards and industrial plants of all kinds needed an increasing number of cranes and needed them in a hurry. So they simply added to their facilities and confined their work to their usual lines, giving preference to the government.

Foundries were called on for their usual lines, except that castings for peaceful purposes became less and those for war became more, but the practice was not essentially changed, except that the highest grade of work was required.

On the other hand, some plants now turn out devices they never had thought of doing two years ago. The Federal Pressed Steel Co., is making trench bombs and brass cases for 75 millimeter shells. The A. O. Smith Co., is making trench mortars. The Harley Davidson Co., manufacturer of motorcycles, continues to make these for the use in the army, but in less number than previously, and has taken on a large contract for grenades. The Evinrude Motor Co., maker of small motors and propellers for use on rowboats and canoes, is making depth bombs and trench mortar bombs. The Milwaukee Separator Co., is producing an airplane starter, while Matthews Bros., whose usual output is the interior trim for office and home, are manufacturing propellers, fuselages and other wooden parts for airplanes. The Great Lakes Boatbuilding Corp., organized to build launches and pleasure boats, is building submarine chasers.

An Engine a Day

The Falk Co., steel founder, is making steel castings for the Emergency Fleet corporation, including stern and bow parts. Engines for cargo boats of 3500 to 4000 tons are made in the shops of the Allis-Chalmers Mfg. Co., the Filer & Stowell Co., the Nordberg Mfg. Co.,

and the Power & Mining Machinery Co. Among these four companies production has been developed to the point where practically one engine is made every working day.

The Allis-Chalmers Mfg. Co., Gen. Otto Falk, president, was the first Milwaukee concern to produce war material. This was in 1915, before the United States had entered the struggle, and at a time when many manufacturers refused munition work on the grounds of neutrality. At that time the Bethlehem Steel Co. sublet to the Allis-Chalmers Mfg. Co. a large contract for machining shrapnel and high explosive shells. An addition was erected and machines were constructed for the various operations, most of them being built by the company for its own use, as machine tools were difficult to obtain from regular manufacturers. After some preliminary difficulties production of shells was brought to a high state of perfection and the contract was completed ahead of time. With this early training, it was easy for the Allis-Chalmers organization to grapple with new problems when the United States entered the war and to devote its energies to essentials. It now has a large shell shop, is building engines for the mercantile marine fleet, turbine engines for torpedo boat destroyers, hollow steel shafts for the same craft and mounts for guns of 14 to 16-inch diameter. It is also machining steel gun parts.

Practically every department is now on war work, the great boiler shop recently having been turned over to the fabrication of ship material for the Emergency Fleet corporation. A new forging and heat treating plant has been built capable of handling the largest gun forgings. In fact, this plant is equipped for the complete production of 16-inch guns if the government desires to have them manufactured so far from the seaboard.

The plant of the Cutler-Hammer Co. offers less of the spectacular, but it is supplying what might be termed the brain and nerves of submarines, scout boats, warships and merchant ships. Every submarine built by the United States and many of those built for the Italian, Russian and British governments are equipped with controllers from this plant. For the navy it is making turret turning equipment, steering gear control, blinker light and searchlight control, winch and windlass motors, and it is also making ventilating devices and controls for ships of the Emergency Fleet corporation and the Submarine Boat Corp.

One of the most remarkable responses to the needs of the government was the formation of the Wisconsin Gun Co. and the establishment of its great plant for the manufacture of ordnance. At the request of government agencies a group of Milwaukee men formed the company, used their own credit and resources and enlisted that of others for financing the plant. A site was obtained and the structures erected in record time, about 60 days sufficing. Equipment was bought and installed as fast as the buildings were roofed and when it was ready to begin operation the past summer it was practically six months ahead of the schedule provided by the government. As work progressed the government paid the expense involved, and on the completion of the plant, it reimbursed fully the men who put their time and money at its disposal. A great workshop was provided without the necessity of the government attending to details. When the war is over the plant and equipment will be taken over by private capital.

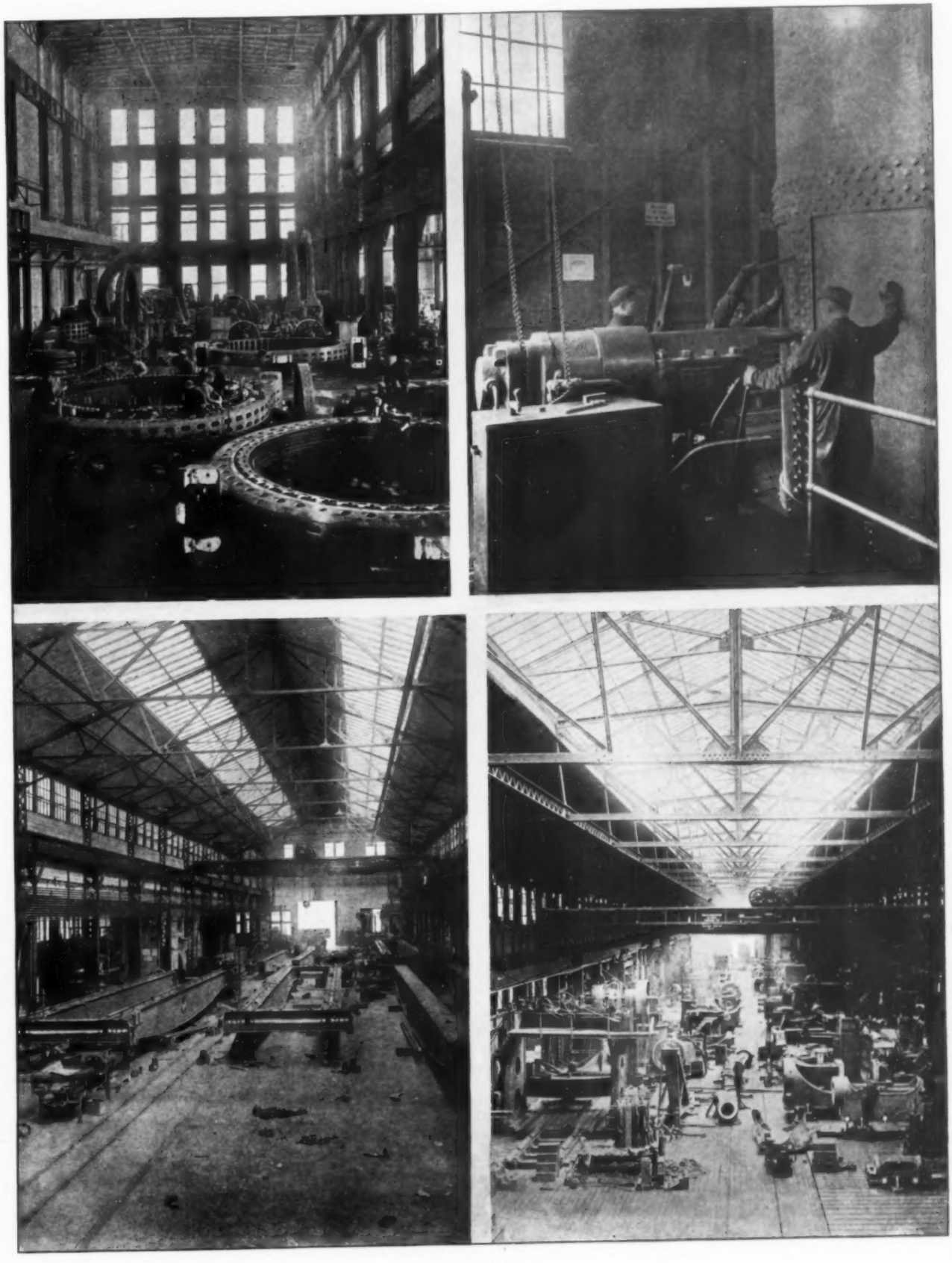
Another such plant, that of the Four Lakes Ordnance Co., has been built in Madison, Wis., by private capital and equipped to make guns of various caliber, the government supporting the enterprise.

Location of ordnance plants so far west was one of the first evidences of the desire of the war industries board to avoid further industrial crowding in the east. Ample supplies of material and equipment from steel mills and machinery manufacturers were close at hand and the labor situation was all that could be desired. The results of the government's policy to stimulate war industry in this district have been entirely satisfactory.

One effect of war has been to make the by-products of coke manufacture very valuable. Milwaukee, handling much coal arriving from the east by boat, has become also a large producer of coke, the toluol, phenol, benzol and trinitro toluol derived from the by-products, gas and tar, being used in the manufacture of explosive. The Schlesinger interests, heavily interested in pig iron and coke production, organized the Newport Chemical Works, Inc., and erected at Carrollville, a suburb of Milwaukee, a great plant to distill the crude products of coke manufacture and ship the refined products to the centers where explosives are made. The output is so large tank cars are used for the

FOURTEEN-FOOT PROPELLER MADE BY SHERIFFS MFG. CO. FOR EMERGENCY FLEET CORPORATION

Milwaukee Shops in Second Line Trench



GOVERNMENT INSPECTOR EXAMINING HAND GRENADES IN MILWAUKEE PLANT.

shipments. When the war is over the same plant will produce other derivatives of coal tar and gas and the economic gain will be great as little attention was paid previously to this production, imported chemicals being relied on while the by-products of coke went largely to waste.

Public spirit has been wholly devoted to the winning of the war. Committees have been appointed for various details, existing associations have been utilized to the full wherever possible and new agencies established where they seemed to be needed. Much valuable time, which seemed to be needed for the business of the individual, has been spent in the public service. Executives of nearly every large institution in the city have given freely of their physical, mental and financial resources to forward the one big task of the hour.

The iron and steel trade has assumed a prominent part in all patriotic efforts, probably involving a larger number of plants and a larger variety of products than any other industry. The diversity of manufacturing in this department, as it existed in Milwaukee before the war, aided largely in getting results without loss of time. From foundry to finished article practically every step in the process of manufacture is carried on at home, without calling on other cities for aid. Few cities are so well equipped for a wide range of production and not all have the spirit to achieve as Milwaukee has done.

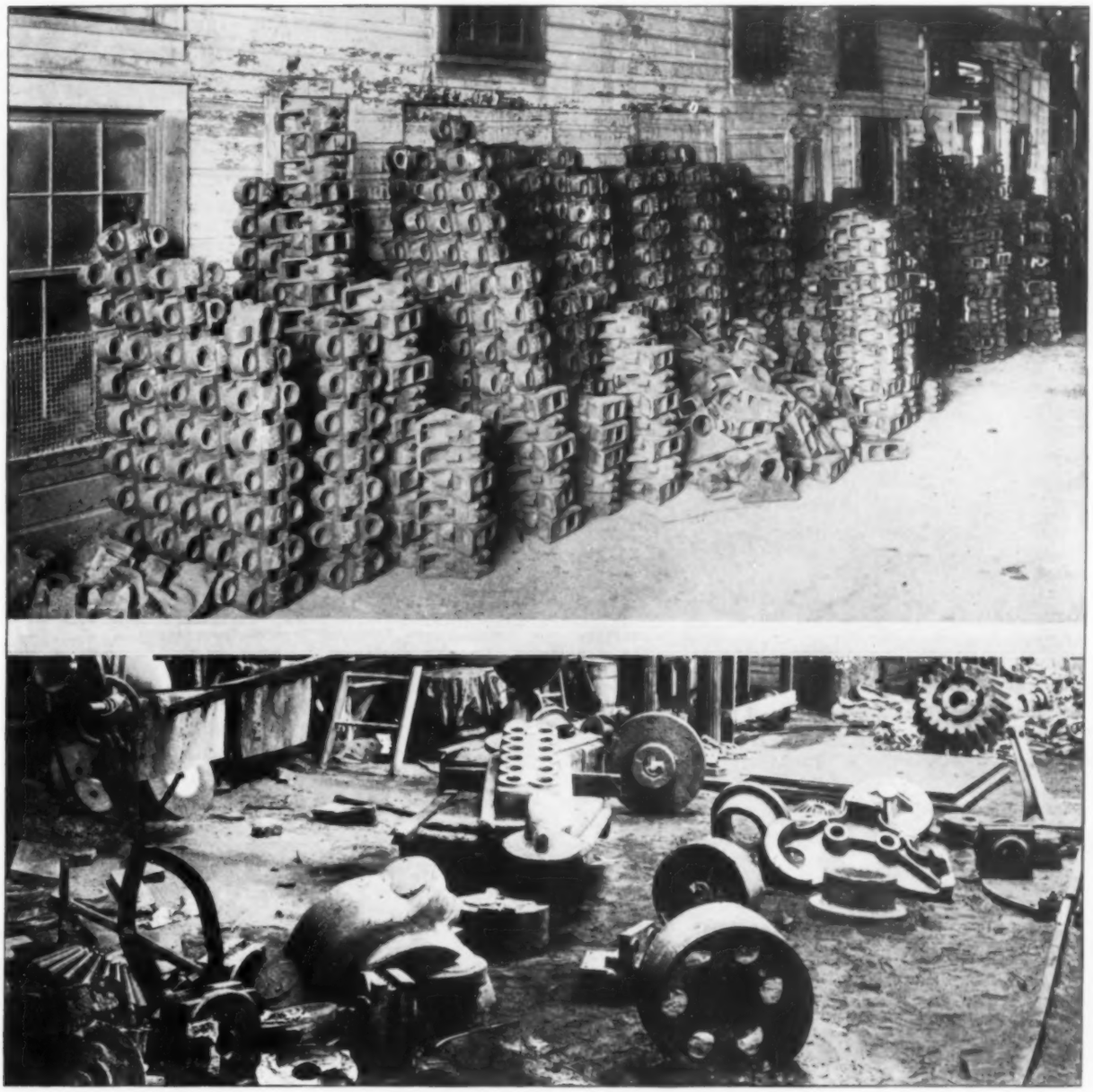
SAND-BLASTING ANNEALED GRENADE CASTINGS. THE WORKMAN IS EFFICIENT THOUGH MINUS AN ARM.

Included in the industrial district of which Milwaukee is the leader are Racine and Kenosha, sister cities on the shore of Lake Michigan, linked closely in every way. These cities also have assumed their burden of war work and are aiding in no small way to provide necessities for the struggle. The traveler visiting Kenosha may see every day a trainload of army trucks leaving the great Jeffery works. Dull colored, prosaic vehicles they are, but the army is munitioned and fed by their aid. Hundreds of these are turned out weekly where formerly pleasure cars

Some of Milwaukee's War Products

Shells
Grenades
Trench bombs
Depth bombs
Airplane bombs
Gun carriages
Explosives
Loading grenades
Gun carriage forgings
Toluol
Phenol
4.7-inch guns
75-mm. guns
Gun carriage poles
Ammunition truck bodies
Steel wheels
Cartridge cases
Tin fuse containers
Booster casings
Livens projectile shells
Naval mine cases
Naval mine floats
Gas projectiles
Trench mortars
Trench pumps
Shrapnel
Mine heads
Trinitrotoluol
Gasoline engines for radio
Engines for dirigibles
Airplane self-starters
Gasoline locomotives
Airplane propellers
Fuselages
Stern and prow castings
Cargo boat engines
Fuse parts
Machinery
Naval gun mounts
Marine engines
Propeller wheels
Tanks
Filters
Fabricated ship parts
Compasses
Compass parts
Cranes and hoists
Submarine control devices
Turret turning devices
Searchlight control
Blinker light control
Winch and windlass engines
Destroyer turbines
Destroyer shafting
Gun forgings
Scout boats
Motorcycles
Liberty motors
Trucks
Refrigerating machinery
Engines and condensers
Artillery harness
Harness hardware
Saddles
Uniforms
Insignia
Shoes and puttees
Underwear
Hosiery
Sweaters
Aviators' clothing
Helmets
Gloves

way to provide necessities for the struggle. The traveler visiting Kenosha may see every day a trainload of army trucks leaving the great Jeffery works. Dull colored, prosaic vehicles they are, but the army is munitioned and fed by their aid. Hundreds of these are turned out weekly where formerly pleasure cars



UPPER—MACHINE GUN CASTINGS AT PLANT OF GERLINGER STEEL CASTINGS CO. LOWER—SHELL HOLDERS, CRANE CASTINGS, SUPERHEATER CASTINGS FOR EMERGENCY FLEET CORPORATION AND CONCRETE MIXER CASTINGS FOR NAVY AT PLANT OF STANDARD CRUCIBLE STEEL CO.

were the product. From this city also comes harness, hosiery, woolen underwear, rope and cable, bronze bushings, army cots, ship berths and escort wagons, also 75 millimeter shells, which are assembled there.

Racine is predominantly a metal-manufacturing city and thus naturally falls into the war-production class. It has many foundries, steel, gray iron and malleable, from which come a steady stream of castings. In the city's list of products for the war are jacks and anvils for the army, castings of all kinds, trucks, motorcycles, army raincoats, shoes, boilers for the Emergency Fleet corporation, army cots and litters, airplane motors, army lockers, wagon forgings, tractors radiators, fire extinguishers for ships and cantonments, lifeboats and life rafts.

The capital of the state, Madison, has a large capacity for manufacturing machine tools. So many additions have been made to plants the originals scarcely can be recognized. Output has been speeded up, heavier types added to the old lines of output, and to cap the whole program, one of the important ordnance plants of the country has been built and put into operation, the Four Lakes Ordnance Co., reference to which already has been made.

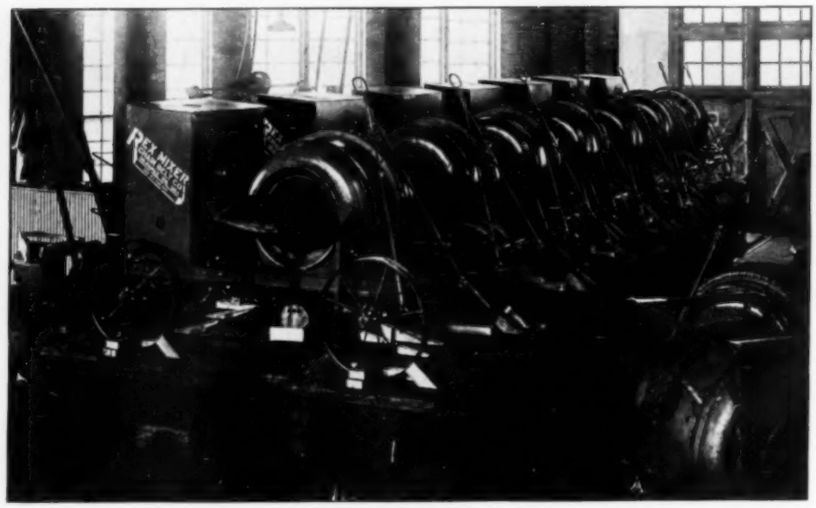
Thus might one go through the state and review the great contributions of Wisconsin to the war. Beloit and Janesville, Green Bay and Manitowoc, Superior and Marinette, all have their part. Milwaukee leads because of location, size and equipment, but the same spirit moves the state.

Naval Guns Transported by New Type of Car

Big guns are one of the leading factors in the world war. Without heavy artillery a present-day army of 10,000,000 men would be as helpless against an opposing army of 1,000,000, well equipped with artillery, as a vessel without a rudder in a typhoon. Consequently, each nation

is striving to outdo the other in the production of large guns in quantities as well as qualities. But in making these guns transportation must be considered. The movement of guns by rail requires special equipment which involves much detail, and interesting features of construction. Recently the Pullman Co., Chicago, delivered to the navy department a transport car designed to accommodate naval guns. It is of unique construction, and although when transporting guns of 16-inch caliber or larger must be supplied with an idler, it easily transports artillery of smaller caliber. It is so designed that in rounding a curve, a 100-foot radius is possible. The car weighs 81,000 pounds and is 56 feet long. When carrying a 16-inch gun the total weight at the breech end is 165,317 pounds.

Essentially the car is composed of two flat cars of special design, with a bridge placed on them to carry the load. The car is mounted on four 70-ton trucks, spaced 10 feet from center to center. The bridge which connects the two flat cars and carries the load, has a large steel casting on each end, which fits over the auxiliary center plate. These castings are joined by a girder. The end of the girder carries two cradles which extend to the side sills and resist the tendency of the bridge to tilt. The center is formed of a V-shaped cradle in which the barrel of the gun rests. At the muzzle end, a removable cradle built of structural steel is provided. To provide means for fastening the guns, two 1½-inch bolts pass through each cradle. The flat cars each have a separate braking system. The car was designed especially for the transportation of unmounted gun barrels. A total weight of 286,000 pounds can be transported on it. Large guns when being transported extend over the edge of the trucks, but smaller guns can be easily accommodated.



CONCRETE MIXERS MADE IN MILWAUKEE FOR SHIPMENT TO AMERICAN FORCES IN FRANCE.

Labor Turnover is Reduced by Hiring Women

At a meeting of the New York section of the American Society of Mechanical Engineers in New York city recently speakers commented on the comparatively low rate of labor turnover among women employed in manufacturing plants. L. D. Burlingame, industrial superintendent, Browne & Sharpe Mfg. Co., Providence, R. I., presented a record of 16 months during which women had been employed by the company, showing that during each month of this period the hirings were greater than the number leaving, the opposite being the case with the men. Fewer women had been discharged in proportion to the men, this being in a ratio of 15.6 per cent men to 11.8 per cent women during the first four months of the present year, while in 1917 23 per cent of the men were discharged and only 11 per cent of the women. Among those leaving voluntarily the percentage of women was greater than among the men. Mr. Burlingame concluded that women accustomed to some kind of regular employment were better fitted for shop work than those who came directly from homes and had no training.

Labor turnover was classified as a symptom of defective management by H. E. Miles, member of the committee on classification of personnel in the army. He said that a shop requires a training room to produce skilled employes, pointing to the success British and French manufacturers had obtained with such a system.

NEWPORT CHEMICAL WORKS, INC., CARROLLVILLE, MILWAUKEE, DISTILLING CRUDE COAL BY-PRODUCTS FOR HIGH EXPLOSIVES.

Milwaukee Foundries Serve all Industry

Traditions Which Have Given Prominence to City's Industry Sustained by Loyal Response to Every War Demand

BY D. M. AVEY

MAHN-AH-WAUK is the Indian term conceded to be the original name for Milwaukee. It is a phrase rather than a word, and dating back to the days when the warring tribes met together to feast and smoke, it has meant, "Place where all meet together." This description applies no less today. The tribes from the plains, the mountains, and the north woods have given place to practically all the nations of the earth. Milwaukee is truly a place where all meet together, cosmopolitan, yet thoroughly American.

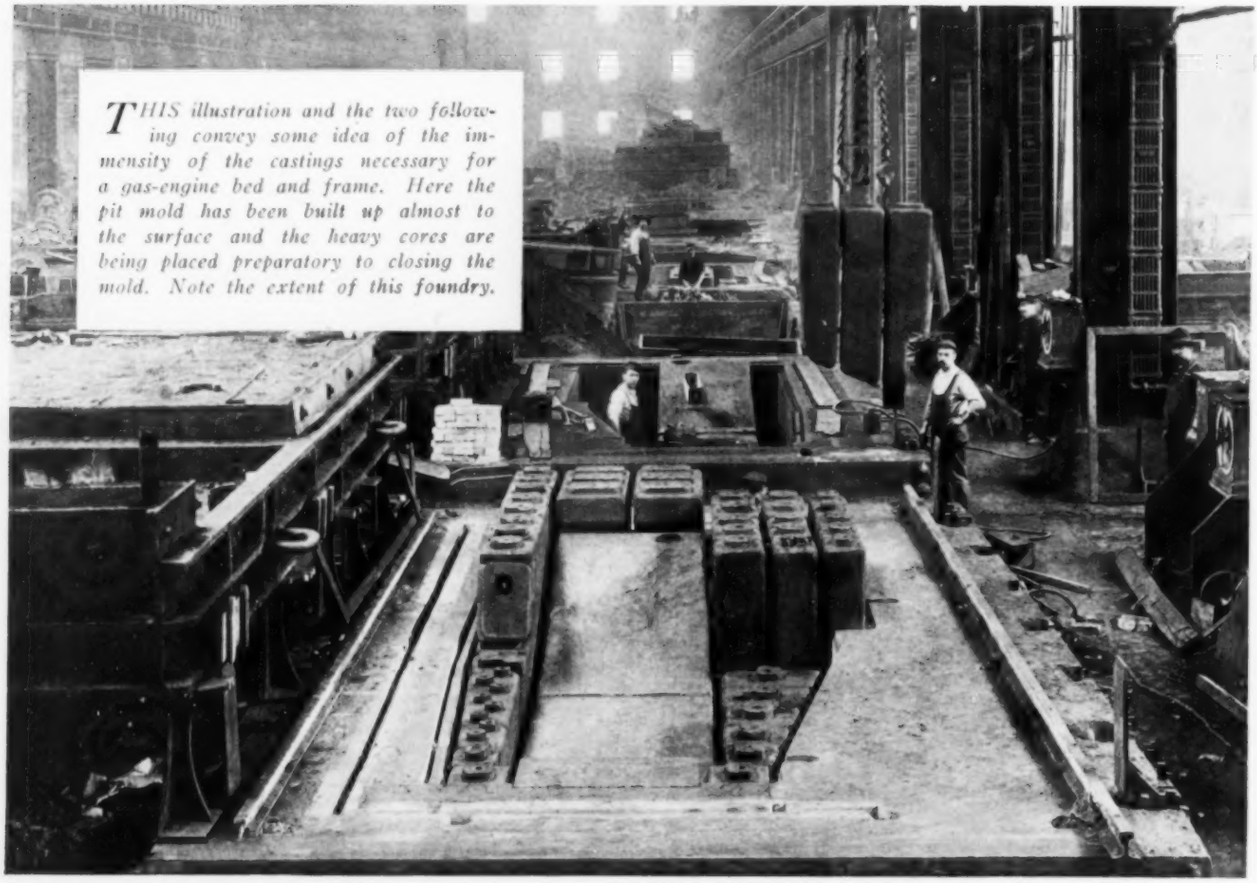
Industrially the same divergence of interests gathered together in one community is apparent. The various changes in our manufacturing development resulting from national growth have been mirrored in the industrial life of Wisconsin's largest city. New conditions have in every instance induced a change, and a growth in all manufacturing lines has followed every shift in the development of the great northwest. In no one line of activity is this growth more apparent than in the foundry business, and here again is typified the place where all meet together. At present practically every known foundry product is made in or about Milwaukee. Gray iron, malleable, steel, semisteel, brass, and alloyed metal castings are produced in quantity, and by the use of practically every mode of manufacture. There are 97 foundries in Milwaukee and the numerous adjoining cities which go to make up this one industrial community.

One naturally seeks the reason back of such a preponderance of a single line of manufacture. That in this city, remote from the coal fields, the foundry industry should have experienced such tremendous growth is extraordinary. The answer lies in the character of the demand rather than in the availability of raw material supplies. It is a case of the mountain come to Mohammed.

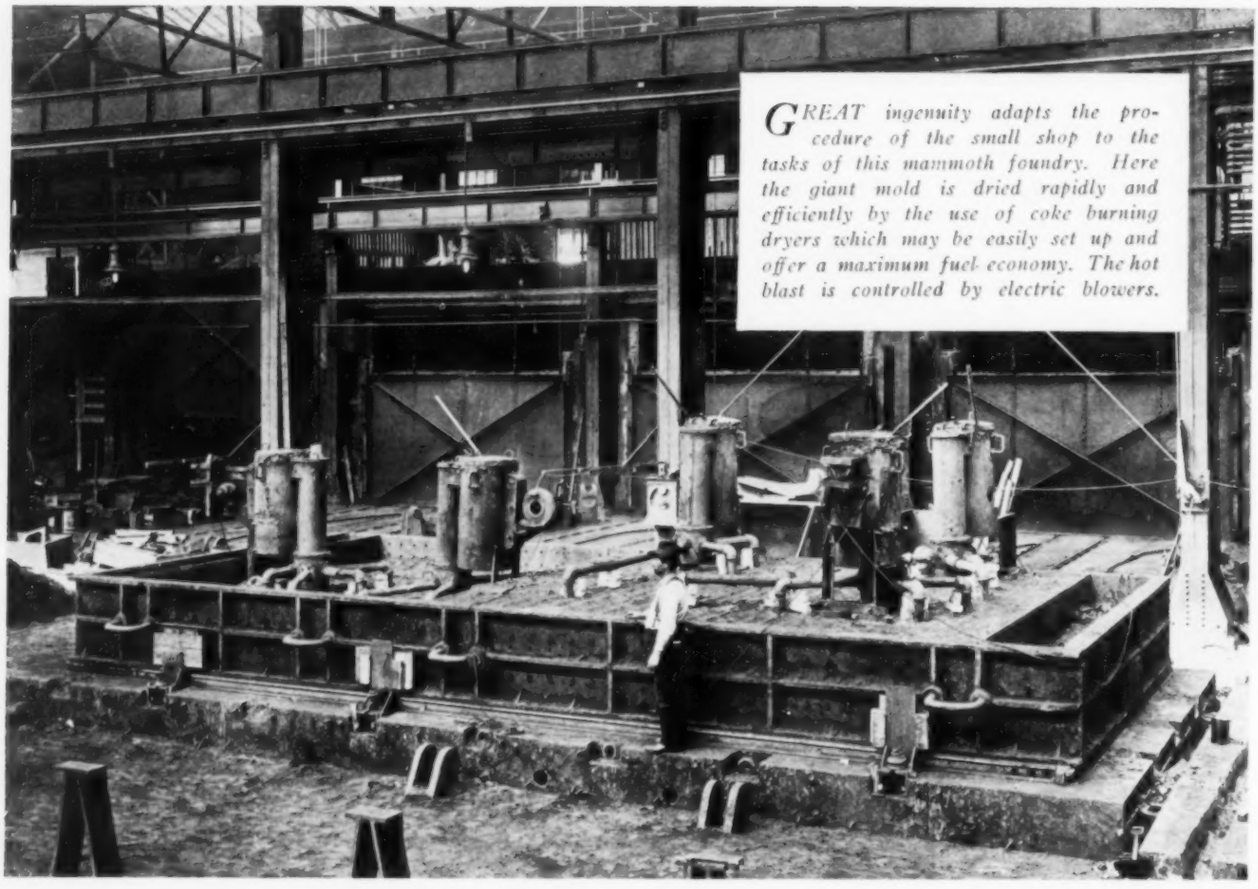
The early history of the city is identified with peculiar economic conditions. A natural harbor afforded outlet for grain and timber across the lakes to earlier established eastern centers. The market for mill machinery in western New York and parts of Ohio was saturated, and the business insight of a few pioneer machinery manufacturers suggested that

Gearing Shops to War

CONSIDER a tiny gear complete to its seven sharply formed teeth no larger than the capital letter which initials this paragraph. Then picture a single gear casting 24 feet in diameter and weighing 30 tons or more. The first operates unseen, faithfully marking the time in the clock upon your desk. The second drives at top speed a rolling mill making shell steel for the army. Gears great and small, rough cast or refined by expert machining to the ten-thousandth of an inch constitute an important phase of Milwaukee's foundry activity. Great and small gears in every stage from every metal capable of receiving form in a molten state are made in quantity by the foundries of Milwaukee. These potent castings without which no power can be applied, and no force translated into motion, form only a small portion of the varied products, and but a minute conception of the output which places the "Cream City" sixth among the foundry centers.



THIS illustration and the two following convey some idea of the immensity of the castings necessary for a gas-engine bed and frame. Here the pit mold has been built up almost to the surface and the heavy cores are being placed preparatory to closing the mold. Note the extent of this foundry.



GREAT ingenuity adapts the procedure of the small shop to the tasks of this mammoth foundry. Here the giant mold is dried rapidly and efficiently by the use of coke burning dryers which may be easily set up and offer a maximum fuel economy. The hot blast is controlled by electric blowers.

grain and timber could better be shipped as flour and lumber. The result was a few small plants making mill machinery in the early forties. These developed their foundries early in their progress and formed the nucleus of the present day foundry center in Milwaukee.

In no locality is the principle of repeated expansion better demonstrated. Few of the present great foundry interests of Milwaukee had a Topsy-like origin. In almost every case the present manufacturing concerns are a development, an expansion, a branch, or an outgrowth of some early plant. Practically without exception each concern was founded through someone brought up and trained within another and older organization, and this process of development goes back to the first few foundries in Milwaukee.

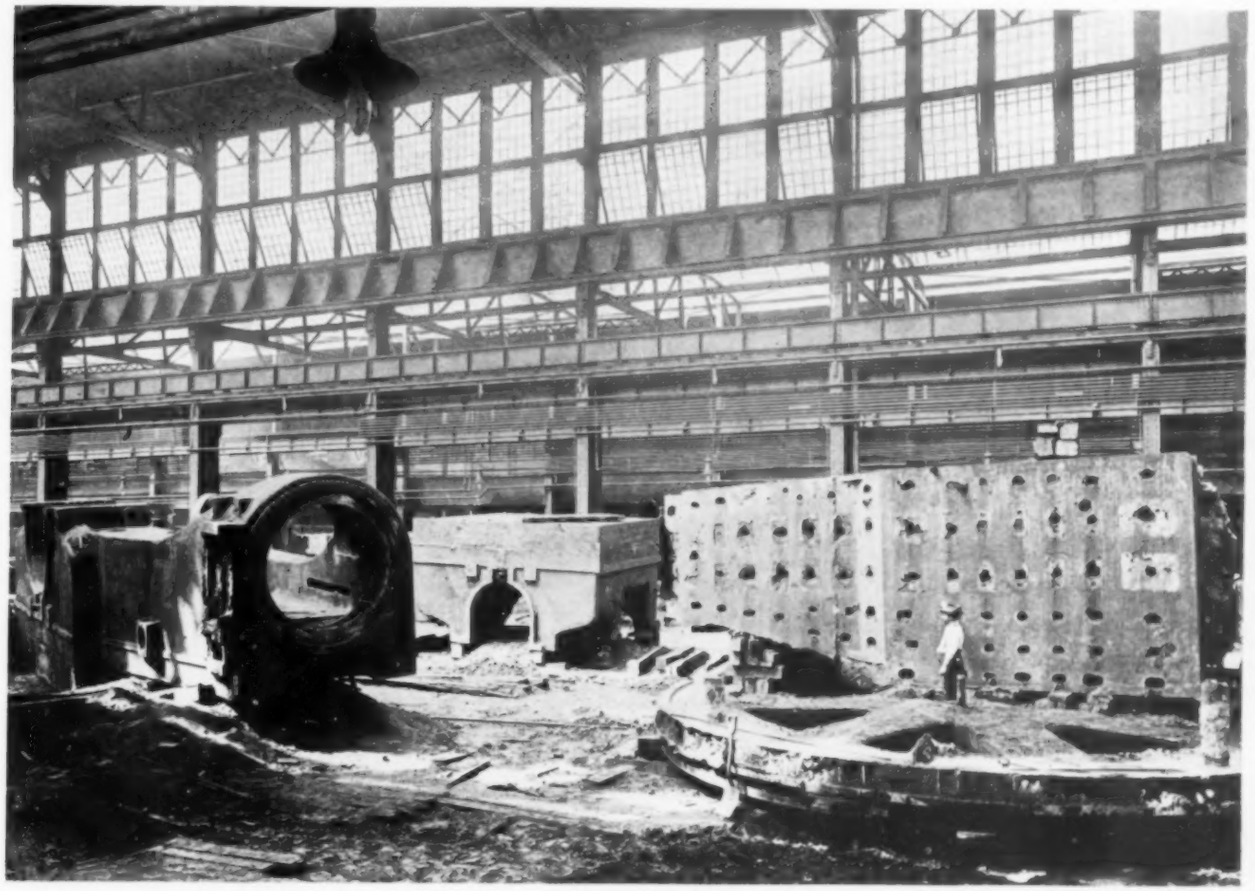
Milwaukee's foundry industry was identified with several most interesting characters in the pioneer days. The first foundry in the city was started in 1843 by B. Bagnall & Co., and this became the nucleus for a larger plant which made castings for steam engines, and for the various classes of machines required in flour mill construction.

The opening of the middle and northwestern wheat regions, and the gradual decline of the milling business in western New York brought to the west several men who became the compelling force. Among these was Capt. A. J. Langworthy who, with Nelson McCraken, became the founder of the Wisconsin Iron Works. This company passed through various vicissitudes culminating in the hard times of 1857 which led to the consolidation a few years later with a threshing machine company under the name of Kirby, Langworthy & Co. This partnership was broken up in 1869, and the foundry and machine shop holdings were sold to Filer & Stowell Co., who coincidentally established the Cream City Iron Works for the manufacture of saw and grist mill machinery.

The present Allis-Chalmers Mfg. Co. likewise grew through various stages starting with the manufacture of mill machinery. Stove manufacture, the establishment of a pipe foundry to meet an emergency, namely the construction of city water mains, and the addition of the present wide range of heavy machinery have all carried a remarkable foundry development.

The Vilter Mfg. Co., builder of various types of steam engines and a wide range of refrigerating machinery, was started in 1867. This company, founded by Peter Weisel, was carried forward by Theo. O. Vilter, who entered the old engine repair shop as an apprentice. This plant, which now employs about 125 men in its foundry alone, has constantly carried its foundry facilities in advance of its machine shop requirements and has always been able to take in outside work. Its two cupolas, one 30 tons per day devoted to semisteel and the other 50 tons per day to melting gray iron, now supply enough surplus from shop needs to care for Emergency Fleet engine orders as well as a range of special requirements.

Another foundry established at a later date has been the progenitor of several of the most active of Milwaukee's manufacturing establish-



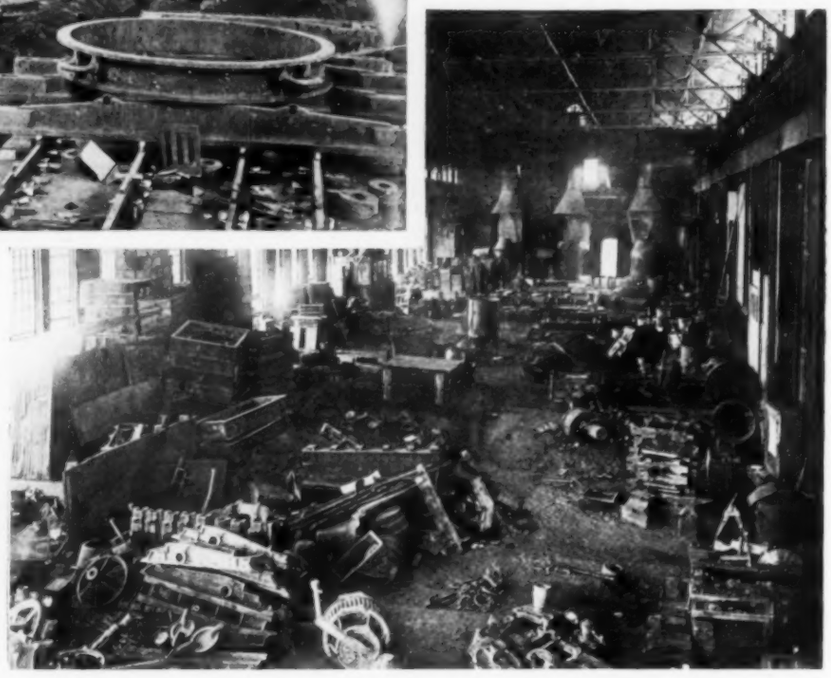
THESE GREAT CASTINGS WHICH TODAY FORM THE BASE AND FRAME FOR A STEEL MILL GAS ENGINE UNIT INDICATE THE MAGNITUDE OF THE WORK EMANATING FROM MILWAUKEE. A LARGE NUMBER OF ENGINES FROM THE PLANT OF WHICH THIS FOUNDRY IS A PART ARE IN SERVICE IN THE STEEL CENTERS

ments. Fred W. Sivyer who was with the Northwestern Malleable Iron Co. in 1882, was the prime mover in these undertakings. The Northwestern malleable foundry was one of the first which was not set up as an adjunct to some machinery manufacturing plant. In 1891 with C. W. Levalley, Mr. Sivyer started a small plant for the manufacture of conveying machinery naming it the Chain Belt Co. Mr. Levalley, who was at that time about 60 years of age, entered upon an entirely new line of endeavor, selecting a field in which this company was practically a pioneer. Soon after, W. C. Frye, destined to aid substantially in the industrial expansion of Milwaukee, became associated with the company. In the beginning four small concerns

MOLDING FLOOR OF A LARGE OPEN-HEARTH STEEL-CASTING FOUNDRY WHERE REDUCTION GEARS FOR DESTROYER TURBINES ARE MADE IN QUANTITY

SECTION OF A FOUNDRY FLOOR WHERE GRAY-IRON ENGINE AND HEAVY MACHINERY CASTINGS ARE PRODUCED

were housed in one building, practically the size of single floor of any one of their present office buildings. These four companies were the Chain Belt Co., Pawling & Harnischfeger, Nordberg Mfg. Co., and J. M. Nash Co. The first named is at present a large manufacturer of conveying machinery, special traveling water screens for industrial plant intakes, concrete mixers and conveying auxiliaries. Pawling & Harnischfeger have built up a large establishment for the manufacture of cranes, hoisting and conveying machinery and special machine tools. Nordberg Mfg. Co. occupies a prominent place among designers and builders of steam and fuel oil engines; steam air and electric hoists, and compressors. The J. M. Nash Co.



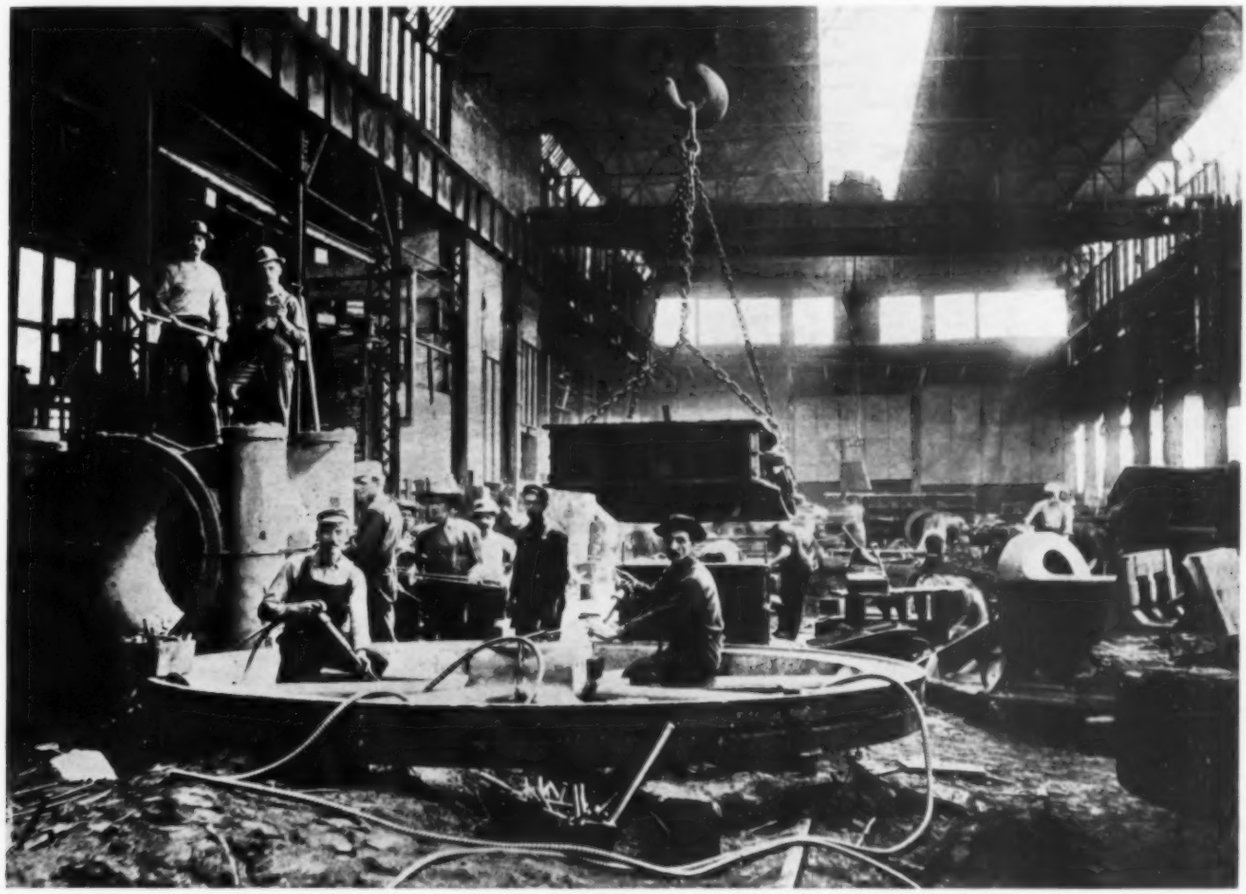
THIS FOUNDRY WAS ORIGINALLY DEVOTED EXCLUSIVELY TO CRUCIBLE STEEL—THREE OF THE CONVERTERS WHICH FORM THE PRESENT STEEL-MAKING EQUIPMENT MAY BE SEEN IN THE BACKGROUND

has developed an extensive business in the manufacture of special woodworking machinery.

The Chain Belt Co. in turn formed the starting point for several other industries. In 1909 F. L. Sivyer, W. C. Frye and Donald Fraser, the latter superintendent of the Chain Belt company, started the Sivyer Steel Casting Co., in a building rented from the Northwestern Malleable Iron Co. This company had for its object the manufacture of crucible steel castings and later was among the pioneer makers of electric steel. Following this a few years, W. C. Frye, C. R. Messinger, Donald Fraser and W. C. Sargent, all associated in the parent company, bought the West Allis Malleable Iron Co. and changed the name to the Federal Malleable Co. Since that time part of the same personnel has become identified with Charles Piez and Prentice Coonley in an electric steel company in Chicago.

The same faith which has been demonstrated in the constant growth of the industry in Milwaukee, has resulted in many advances in foundry practice. New developments have found ready acceptance, and in many instances Milwaukee has taken the lead. Here some of the earliest crucible steel foundries were established. In 1909 there were 10 of these plants in this city then conceded to be the center of the crucible steel casting industry. The annual production of these foundries was in excess of 30,000 tons. The furnaces used were known as the Milwaukee type. They used crude oil for fuel, the use of which was developed among Milwaukee foundries. Later producer or commercial gas was used for fuse crucible furnaces, and finally came the converter, the open-hearth and eventually the electric furnace.

Interest today centers on semisteel. Following tardily the example of France and England, the government is contracting for millions of semisteel shells. While Milwaukee cannot claim credit for the doctrine of semisteel, she has reared some of its most devoted prophets. Probably 40 or 50 years ago, a mixture of gray iron and steel was tried experimentally in England. But at least 35 years ago this metal mixture solved a perplexing problem for the foundry foreman of the old Chicago, Milwaukee & St. Paul railroad shops. Elijah Fairbairn was the man in question. An important part of the equipment of the car shop was a bulldozer used to shape the diamond bars used at that time in car trucks. These bars were formed hot between dies. Two strokes were required on each bar, and two bars were required for each side of each truck. Consequently the bulldozer was in constant operation to supply the needed output. It was found that the dies were short lived. Cast iron lasted only about 48 hours in this service and steel dies were even less durable. As the operation was performed on bars heated cherry red, carbon steel dies quickly developed surface cracks. In his perplexity, Elijah Fairbairn conceived the idea of semisteel, though he would not have recognized his cupola mixture by that name and modern authorities on that alloy might question the accuracy of the term. He melted some cast scrap and steel chips from locomotive tires separately, and mixed the molten metals in a ladle. From



ENGINE BUILDING ABSORBS PART OF THE OUTPUT OF THIS FOUNDRY AS IS EVIDENT, BUT THE MANUFACTURING PLANT OF WHICH IT IS A PART PRODUCES A VARIETY OF MACHINERY INCLUDING EQUIPMENT FOR REFRIGERATING PLANTS

this mixture he poured a pair of dies which came from the molds in flawless condition and were at once put in service.

During the next week, routine matters engaged the foreman's time, but every day he found opportunity to inspect the dies in the bulldozer. The following week and that which succeeded found no deterioration in the castings. They kept their contour and showed no signs of surface cracks or abrasions. The longevity of the dies became a matter of common shop interest and they were closely watched until discarded at the end of three months continuous service. Mr. Fairbairn endeavored to duplicate the conditions which had produced these castings, but although similar materials were used, the record of the first pair was never equaled. A mixture of steel and cast iron continued to be used, but the ideal was not attained again.

Semisteel Successfully Produced

It was not until many years later that what is properly called semisteel was produced successfully and continuously. This again was in Milwaukee at the foundry of A. Christensen, now the National Brake & Electric Co. At this plant, the modern method of using a large percentage of steel with cast iron to produce castings of light section was first developed. And the prophet of the doctrine of semisteel, who is well known to the whole foundry industry, is David McLain, then with the A. Christensen foundry.

Molding Machine Speeds Production

The Prairie du Chein shops of the St. Paul railroad, which were presided over by Elijah Fairbairn, have another claim to pioneer foundry honors. In the early eighties attention was not so sharply directed to quantity production. Labor, which after all is the sharp stick behind increased output, was plentiful and cheap. Greater deliberation prevailed in all lines and more especially in railroading. Nevertheless the volume of production expected from this railroad foundry increased steadily, and some departments were scrutinized to find means for meeting the demand. Car brasses were needed in greater quantities, and even a cursory examination showed that the molding operation was the factor underlying the delay. Accordingly an improvised stripping plate molding machine was devised which speeded up the entire chain of production. This was in 1884, and probably this machine was one of the first examples of this now common form of foundry equipment.

Steel casting has shown remarkable progress in Milwaukee. With the increasing cost of oil fuel, crucible steel casting encountered difficulties. This city was not slow to appreciate the condition, and some of her larger foundries at once installed converters which were used in conjunction with cupolas. Others developed open-hearth facilities to meet the need for steel, and electric furnace practice in turn was accepted practically in its incipient stage. With the more general adoption of this later type of steelmaking unit, Milwaukee has gone rapidly forward until at present there are six foundries with seven electric furnaces in Milwaukee.

MAIN MOLDING FLOOR OF ONE OF MILWAUKEE'S LARGEST FOUNDRIES WHICH PRODUCES OPEN-HEARTH STEEL CASTINGS—GRAY-IRON CASTINGS FOR ENGINES AND VARIED HEAVY MACHINERY ARE MADE IN THIS FOUNDRY

Milwaukee Recognized in 1892

The country at large did not take stock of the foundry industry of the Wisconsin metropolis until about 1892. At that time there were 18 gray iron foundries in Milwaukee with a capacity of about 80,000 tons per year. Most of the output was utilized within the city in the manufacture of a wide variety of machinery or in car building. There were only two malleable plants, with an output of about

15,000 tons per year. Mitis iron, an innovation in the early nineties, received notice from Milwaukee foundrymen, and the malleable plants produced some of this material which is an alloy produced by dead melting gray iron with a percentage of aluminum.

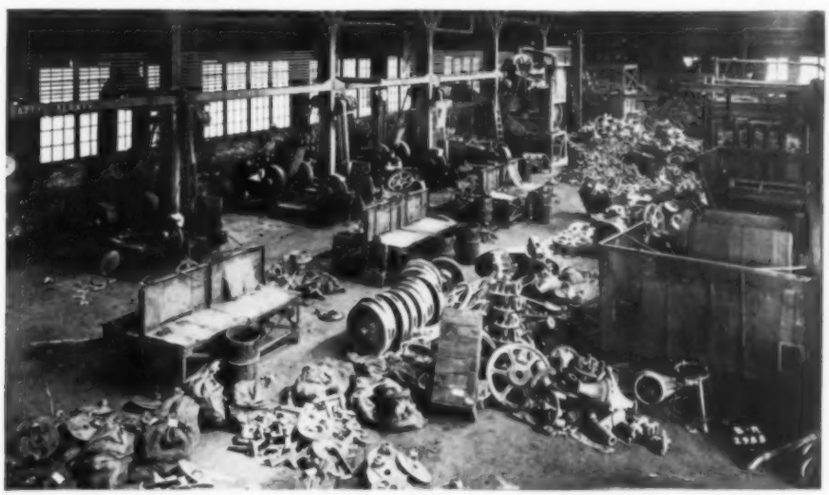
Milwaukee in 1890 had just entered upon her birthright as a machinery manufacturing center. There were about 40 manufacturers in machinery lines at that time, and an investigation disclosed the diverse character of Milwaukee's industries. Steel mills in the Pittsburgh region were operating over 50,000 horsepower of Milwaukee-made engines. Heavy mining machinery from this city was found in almost every western state.

It was only a few years later when recognition was secured as the leading city of the United States in steel foundry activity. In 1907 the Falk Steel Casting Co. was said to be the largest of its kind in the country with George H. Smith Steel Casting Co. second and other Milwaukee steel foundries following well up on the list. The Falk Steel Casting Co. was established in 1900 as an oil-fired crucible plant. Later three 15-ton, an 18-ton and a 25-ton open-hearth furnace and a complete producer gas plant were installed. The present capacity is over 2000 tons per month. The history of the company is identified with the policy of advancing men from within the organization. Every man in an executive position at the present time has worked up through the foundry. This has resulted in what is termed a "hand picked" organization and has developed a co-operation which counts in the production results. The prewar output included special castings, gears, car sundries, tractor parts and a wide variety of small miscellaneous steel castings. At the present time this plant is engaged 100 per cent in direct or indirect war work, including special castings for the navy department, gun mounts, car castings and tractor parts. The gear department is handling a variety of large work including helical reduction gears for use with marine turbines.

AN ELECTRIC FURNACE UNIT IN ONE OF MILWAUKEE'S STEEL FOUNDRIES

The George H. Smith Steel Casting Co. started as a crucible steel foundry. In 1898, faced by an increase in fuel costs and the limitations in volume of metal produced, the company installed a converter. Later other converters were added until at the present time the melting equipment includes three 2-ton converters and a 4½-ton open-hearth furnace. The floor area exclusive of office space and pattern storage has increased from 9000 square feet in 1898 to 45,000 square feet. This company developed a special low carbon steel for electric motors and generators, and produced a greater quantity of this class of work than any other single foundry in the country. The present output of about 750 tons per month is all for war lines.

Gray iron, malleable, semisteel and steel castings all are produced in quantity in Milwaukee. From the colossal frame for the heaviest gas engine to the thin-walled motorcycle cylinder, the products of iron are wrought through metallic processes by fire into tributes to the skill of Milwaukee founders. Brass, bronze and white-metal alloys, too, are turned out by various casting processes to make complete the machinery which bears the stamp "Made in Milwaukee." A splendid spirit of co-operation governs. Manufacturers, though natural competitors, are in accord, and through their commercial associations strive to advance their general industrial interests. An example of this co-operation is found in an arrangement by which the problems of labor under war conditions are met. The Milwaukee Metal Workers and Founders' association has a plan, followed by many foundries, by which continuous service is rewarded. By this plan a workman at the end of his first three months' service draws a bonus of 2½ per cent of his wages previously earned. At six months another bonus of 5 per cent, less the first 2½ per cent, is paid. At the succeeding quarter and the end of the first year's service proportionate awards are given, and for every year thereafter he draws his full 10 per cent additional. This serves by definite reward to tie the men to their respective organizations, and the present patriotic incentives are producing the needed output. With the shops of the city all working practically 100 per cent on war work, and with only about 80 per cent of the full labor force obtainable, Milwaukee foundries nevertheless are delivering approximately capacity production to Uncle Sam or his agents.



CORNER OF CLEANING ROOM IN A PROGRESSIVE STEEL FOUNDRY

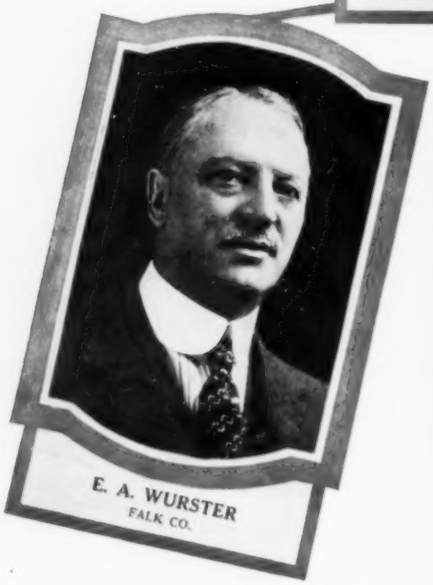
Stage and Figures in Great

DAVID McLAIN
McLAIN'S SYSTEM

E. W. BEARMAN
ILLINOIS STEEL CO.

T. A. GLASSCOT
MILWAUKEE COAL & GAS CO.

AUDITORIUM WHERE CONVENTION WILL BE HELD



E. A. WURSTER
FALK CO.

J. L. MARSHALL
GEO. H. SMITH STEEL CASTINGS CO.

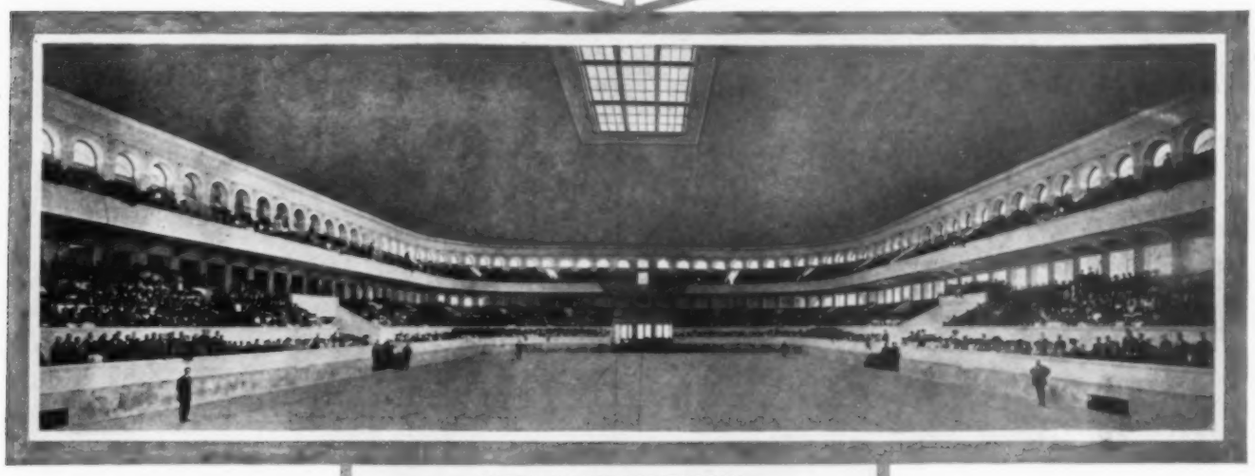
C. R. MESSINGER
CHAIN BELT CO.

Metal Congress at Milwaukee

THEO. O. VILTER
VILTER MFG. CO.

JOHN THOMAS
THOMAS FURNACE CO.

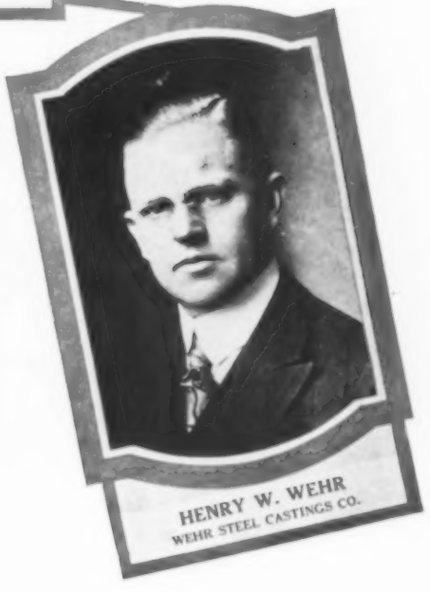
J. H. PINSON
THE AVERY CO.



INTERIOR OF AUDITORIUM

Gen. OTTO H. FALK
ALLIS-CHALMERS MFG. CO.

J. D. BIRD
POWER & MINING MACHINERY CO.



HENRY W. WEHR
WEHR STEEL CASTINGS CO.

Milwaukee Historic in Iron Trade

City Was Cradle of Metal Industry Along West Shore of Lake Michigan—First Blast Furnace West of Ohio Built Just North of City in 1848—"Beautiful Hollow" Destined to be Great Business Center

AS the blast furnaces of the Mahoning and Shenango valleys have formed the basis of the great industrial centers that have been built up surrounding them, so Milwaukee and its vicinity represent the cradle of the iron business and the industries that join with it to make up the manufacturing development along the west shore of Lake Michigan.

The first blast furnace west of Ohio was built just north of Milwaukee in 1848. Three score years and ten is a long way back in the pig iron business and a longer step in the history of Milwaukee and Wisconsin. The factor responsible for this furnace was the deposit of iron ore discovered in a ridge cutting across the state and now named Iron Ridge. At Mayville, an hour's drive by auto from Milwaukee, a blast furnace was built in 1848, the company owning 80 acres of ore land from which its supply was obtained. The one great drawback in Wisconsin in those days, which was not felt in the valleys, was the lack of coal. The Northwestern Iron Co., which built the furnace at Mayville, started as a charcoal iron producer as there was ample timber from which to make that fuel. Not until 1887 did it begin using coke from the ovens at Milwaukee, and not only did it change its fuel but it also changed its ore supply and now uses part ore from the Lake Superior fields and part from its own deposits in Iron Ridge.

This furnace antedates any other now active in the west and was built many years before the stacks at Bay View, Milwaukee, and at Chicago. The latter came into being about 1870 when the Mayville furnace was already well established.

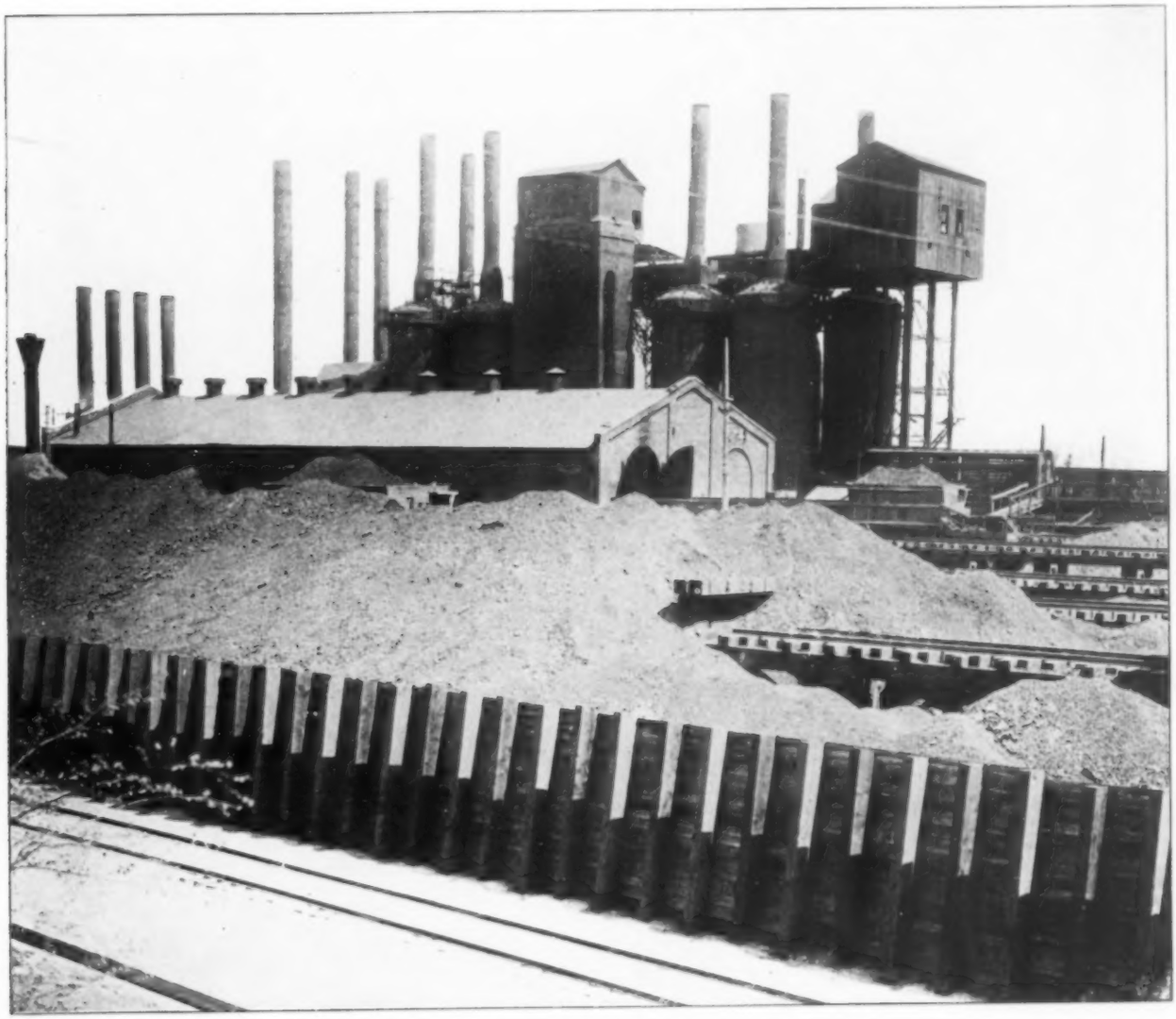
Having obtained a supply of fuel from coke ovens at Milwaukee, the Mayville plant was enlarged by a second stack in 1905. Both have been rebuilt and kept up to date, and while in 1880 the annual capacity was 7000 tons, the furnace now can turn out fully 180,000 tons a year.

Hand in hand with this start in the production of pig iron the metal industry of Milwaukee began in a small way and grew to its present status, one of the largest and most varied in the West. In fact, Milwaukee seems to have been destined from the first

A City Founded on Iron

THAT of all metals iron is the most useful to mankind and that it has a value far exceeding the purposes to which it is immediately put is strikingly illustrated in the development of Milwaukee, a city founded on iron. Here a multiplicity of enterprises, many seemingly remote from the interests of iron, owe their origin and sustenance to iron and the industries directly concerned in its production and conversion to finished articles. Iron was found in a ridge cutting across Wisconsin; this led to the construction of the first blast furnace west of Ohio just north of Milwaukee in 1848. Other industries sprang up; Milwaukee became alive to its possibilities; the great and flourishing city of today was developed by the means of iron and its allied interests. Iron is the webb which holds the structure together. Trace the progress of the city in this sketch of the metal industries of Milwaukee.

BILLET YARD, MILWAUKEE PLANT OF THE ILLINOIS STEEL CO.



BLAST FURNACES, MILWAUKEE PLANT OF THE ILLINOIS STEEL CO.

to be a metal center. No discouragements of the early days sufficed to daunt the pioneers for, like all western settlements, Milwaukee was peopled by rare spirits used to adversity and able to surmount the obstacles that might have turned others from the path.

City is 100 Years Old

One of the Indian names from which Milwaukee is derived signifies "Beautiful Hollow" or bay, from the bold headlands that project into the lake either side of the mouth of the river and six miles apart. Sept. 14, 1818, Solomon Juneau and Jacques Vieau, his father-in-law, landed at the place which is now Milwaukee. The city was incorporated Jan. 31, 1846, and Solomon Juneau was elected mayor in April. The population was 9660.

The valley of the Menominee river, which passes through the city, was the site of the early metal-working industries. In later years the site became too cramped for growing industries, and outlying sites were sought. The south side and West Allis, a suburb, now are the favored locations, with other plants situated on all sides of the city.

The first foundry was located on what was known as the canal, in the Menominee valley, in 1842, by Egbert Mosley, Loring Dewey and Stephen Newhall, all from Detroit. The next year B. Bagnall & Co. established a foundry at Cedar and West Water streets. A year later this plant was sold to Turton & Sercomb and became the nucleus of a millwork and steam engine plant.

In the early days Milwaukee was a port from which wheat, then an important product of Wisconsin and northern Illinois, was shipped east. It was teamed from a hundred miles or more, roads leading from all directions to this port. This fact lured to Milwaukee builders of flour mills in the east where wheat was becoming less of a product. Timber was also being felled for lumber and saw mills were needed. These factors brought A. J. Langworthy from New York state in 1844 and the Wisconsin Iron Works and A. J. Langworthy & Co. were formed. They began the manufacture of flour mills and saw mills in the fall of that year. The first boiler ever fabricated in the state was built by the Wisconsin Iron Works for Philip Best, a brewer, the plates being brought from Buffalo by boat.

How Allis-Chalmers Mfg. Co. Began

In 1847 the Reliance Works was built to manufacture mills, the plant being taken over in 1860 by E. P. Allis & Co., consisting of E. P. Allis, Charles D. Nash and John W. McGregor, the present great Allis-Chalmers Mfg. Co., being the direct descendant of this company. The Reliance Works was enlarged many times and plants were also established

SHEATHED IN CAST IRON, THE IRON BLOCK TYPIFIES ONE OF MILWAUKEE'S LEADING INDUSTRIES

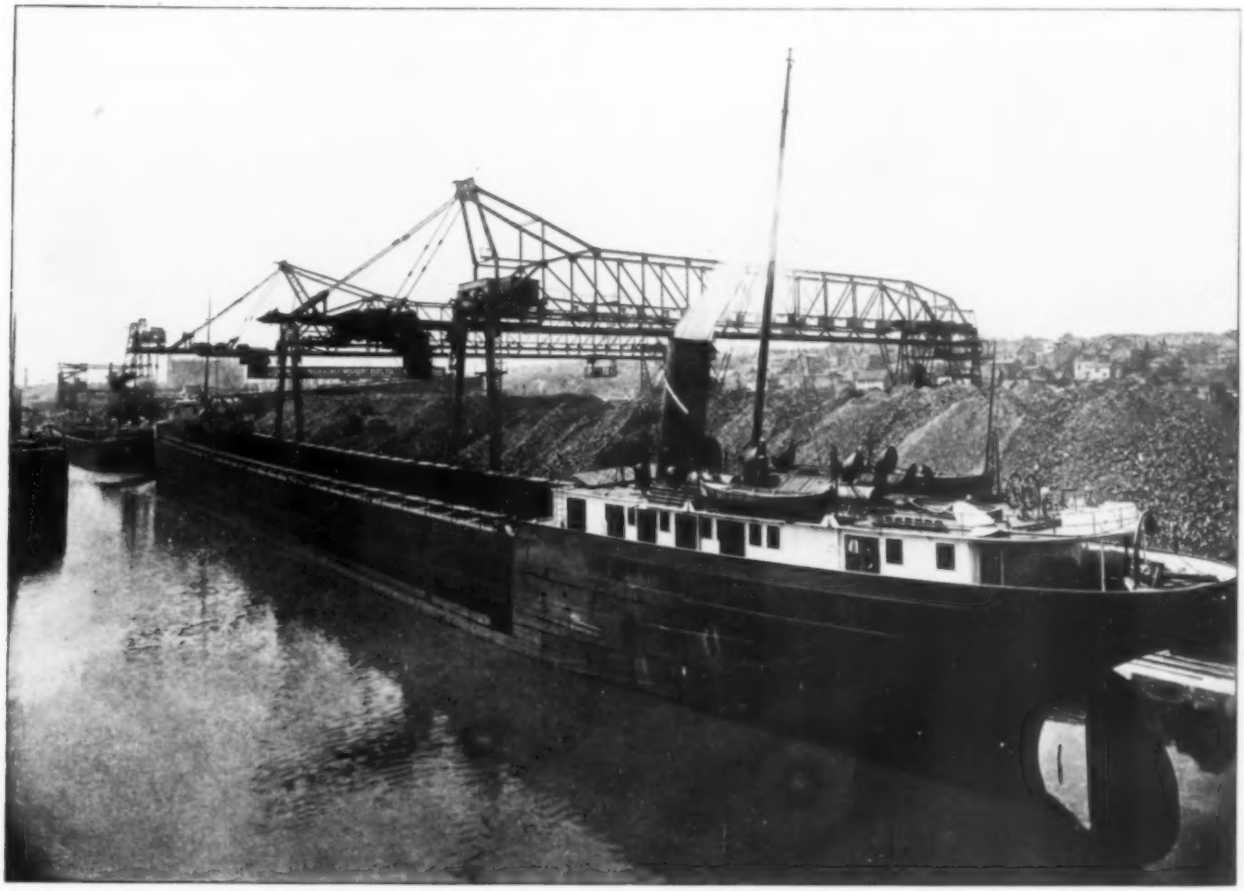
in Chicago and Cincinnati. Later it became apparent that greater space for enlargement would be necessary and a site in West Allis was bought and work at the Reliance Works was almost discontinued. The Chicago plant has been dismantled and sold. Since war demands have increased, the Reliance Works has been put in service again to increase output.

With these important developments in iron and steel manufacture well established other manufacturers were attracted and soon business was flourishing. Foundries were established to make castings for builders of machinery and machine shops to make finer products. Shortly after the Civil war, when the country saw a great increase in industrial lines, Milwaukee received an impetus. Perhaps the most important development was the establishment at Bay View, just south of the city, of a blast furnace and rolling mill plant, now part of the Illinois Steel Co.

The Milwaukee Iron Co. was chartered by the Wisconsin legislature March 8, 1867, with $1,000,000 capital, and bought 114 acres at Bay View. The plant was established on 27½ acres and the remaining 76½ acres were platted for homes for employes. An interesting sidelight on this early effort to house employes is the fact that the sale of liquor on the company's property was prohibited. This prohibition remained in force many years but finally was allowed to lapse. The first furnace was put in blast April 16, 1870, and the second a few months later. Their capacity was 30,000 tons a year. Rolling mills were built with an equal capacity, the purpose being to roll iron rails for railroad use, steel rails not having come into use at that time. With great railroad extension in the west there was a ready market for the entire output.

In 1869 a combination was made of the North Chicago Rolling Mill Co., the Milwaukee Iron Co., and the Wyandotte Rolling Co., the Swedish Iron Co.'s ore holdings and smelter at Iron Ridge being included. In 1873 the financial panic that checked railroad building and gave all business a severe setback caused the plant to close. The death of Capt. Ward, moving spirit of the business, in 1875, threw the concern into the courts until 1878, when the North Chicago Rolling Mill Co. bought up the bonds and took over the plant. Rolling of iron rails was abandoned in 1877, as steel was coming into greater use. The rail mill was converted into a nail plate mill. A merchant mill also added as rail selling declined.

When the United States Steel Corp. was formed this plant became a part of that great merger and so continues. It now has six bar and merchant mills. Its two stacks produce over 100,000 tons of pig iron annually and its steel output is about 230,000 tons. The pig iron is sold in the market and its raw material for rolling comes from other plants which are operated by the corporation.



ORE AND COAL CARRIERS ARE CONSTANTLY DISCHARGING HUGE CARGOES AT MILWAUKEE DOCKS TO KEEP THE METAL INDUSTRIES A-HUMMING. STEAMER MILLINOCKET IN THE FOREGROUND

The remaining blast furnace stack in Milwaukee was built in 1873 by the Thomas Furnace Co. This is located inside the city, on the river, which gives it docking facilities for ore. The original stack was dismantled in 1908 and the present stack was erected. It is rated at 100,000 tons per day. The Milwaukee Bridge & Iron Works was established in 1877 and the Wisconsin Malleable Iron Co. in 1878. Other industries took shape and as busisess recovered from the blow of the panic of 1873 the growth was rapid.

The natural growth of the metal business was for one industry to follow another. The foundry aided the manufacturer by providing his raw material and the machine shop found a source of supply for its castings in the foundry. Steel fabricators followed; then came the malleable and steel foundries, the brass and bronze founders, builders of tools and the general jobbing shop. In Milwaukee this diversification has been carried far and the city is nearly self-contained, being able to obtain almost anything it needs from its own shops.

Though not a part of the iron and steel industry, the production of coke is an important corollary since coke is essential in the production of pig iron from ore and also in melting iron in the foundry. While the first smelting of iron ore at Iron Ridge was with charcoal because of lack of coal or coke lake navigation supplied this deficiency and rendered coal, and later coke, available. Milwaukee always has been an important port for coal and millions of tons are handled from steamer to dock, in addition to the supplies of western coal coming by rail from Illinois and Indiana. The Milwaukee Western Fuel Co., the Philadelphia & Reading and the Lackawanna docks are immense plants, efficiently equipped for unloading steamers and for loading cars. The coal supplies Milwaukee and the interior of the state.

Coke is produced by the by-product process entirely. The Milwaukee Coke & Gas Co. is the only one in the city. It has 160 Semet-Solvay ovens and consumes 1,000,000 tons of coal annually in the manufacture of 800,000 tons of coke. This supplies blast furnace and foundry needs and formerly was available for domestic use as well, until war needs forced a curtailment of the latter in the interest of the former. By-products from these ovens are refined into benzol and other finished products in the new plant at Newport Chemical Works, Inc., recently established at Carrollville, a suburb.

At the plant of the Northwestern Iron Co., Mayville, a battery of 72 Otto ovens has been producing coke for the blast furnaces there and recently 36 more have been built, supplying the entire need of smelting operations. These ovens convert about 500,000 tons of coal annually into 375,000 tons of coke.

An interesting sidelight on the prominent part played by iron in the early days is the existence of a business block at Wisconsin and East Water streets, known as the Iron block. It is a brick building, four stories, 40 x 120 feet, and its peculiarity is that the outer face, instead of being of stone or ornamental brick, is of cast iron plates fashioned in imitation of stone, ornamented by lion heads, from the mouth of each of which depends a strand of grapevine with leaves and bunches of fruit. The iron work is highly ornamental and an indication of the careful work of

foundrymen even at that early date. The building was erected in 1860, following a fire that cleared the wooden structures from that corner. The builder was James B. Martin, who had seen a similar structure in the east and was struck by its appearance and the enduring quality of the exterior. The only changes made since its erection have been in the show windows of the first floor, which have been modernized. The building cost $40,000 and the iron front is said to have cost only $2500.

Leader In Industrial Growth

In 1880 Milwaukee was well established as an iron center. Business had resumed its activity and growth of western cities was phenomenal. Milwaukee was a leader in this increase. There were 30 establishments in the metal trades, employing 1467 men, with a million and a quarter dollars invested. The raw materials for these shops cost $3,795,289 and the finished products brought in $4,204,708.

In 1913 there were 75 iron, steel and heavy machinery plants with 16,200 employes and a payroll of $12,000,000, capital of $40,000,000 and a production of $36,000,000 annually. There were also 30 malleable and hardware plants employing 3220 men. Figures from the annual review of business in Milwaukee for 1917, as compiled by the *Milwaukee Sentinel* are presented in the accompanying table.

General Otto H. Falk, president of the Allis-Chalmers Mfg. Co., reviewed the situation at the beginning of 1918 as follows:

"The increase of business in the metal trades of the Milwaukee district during 1917 was quite marked. That this condition was due to the war is too apparent to require proof. The call for work in this line of industry has not been governed by the usual law of busniess, but instead has been the consequence of abnormal conditions throughout the country as well as the world.

"At the commencement of 1917 the demand for the regular products of the metal trades from private sources and for ordinary business purposes was good and was a continuance of conditions which existed at the close of 1916. During 1917, however, there was a noticeable falling off in the requirements for regular products from ordinary sources. On the other hand, the needs of the government directly and indirectly in connection with war undertaking were so extensive that they more than offset the falling off in the ordinary demands through usual channels. The following statistics show how the business during the year 1917 in the metal trades of the Milwaukee district compared with that of the previous year.

"In 1916 the number of firms representing this branch of industry was 88, while in 1917 there were 97 firms, an increase of nine. The total number of employes in 1916 was 22,244 and in 1917 26,082, an increase of 17.2 per cent. In 1916 the total wages paid was $18,228,981, while in 1917 these wages amounted to $25,916,465, an increase of 42.2 per cent. The total capital employed in 1916 in these industries was $54,049,333 and in 1917 this capital amounted to $60,839,032, an increase of 12.6 per cent. The greatest difference occurred in the increase of the value of the products of these industries, due primarily to the large increase in the cost of material. In 1916 the total value of the product of this branch of industry in the Milwaukee district amounted to $61,633,613, while in 1917 it amounted to $107,802,063, an increase of 74.9 per cent. In 1916 the average wage per year for those employed in this branch of industry was $819, while in 1917 the average under the same condition was $993.

"The abnormal conditions presented innumerable and perplexing problems to the manufacturers due to a large extent to the rapidly changing and extreme conditions obtaining in the raw material market. All the larger plants of the metal trades lost a great many men during 1917 through voluntary enlistment and the draft."

Reasons For Milwaukee's Progress

Since the above was written the industry has gone practically to a war basis. With nonwar industries cut off from supplies of raw material and labor being managed by the government the condition is markedly different than nine months ago. Such demand as may exist from the general consumer is not being cared for, as the government demands full production for its purposes. The figures that were true at the beginning of the year have been surpassed by present conditions and would be much larger were they tabulated to represent present conditions.

Contented Labor a Big Factor

Having seen the growth of metal-working lines in Milwaukee, it is proper to seek some reason for its great success. This rests on many factors, many of them, perhaps, unrecognized. One is the excellent labor supply. Milwaukee workers are not rovers. Living in their own houses they have been slow to follow agitators and have furnished a stable source of supply. Many instances of workers becoming manufacturers and heads of highly successful institutions can be pointed out. Another factor is the willingness of older heads to yield the reins to their sons and younger associates when they have lost initiative. This has kept the city from growing stale and losing its impetus forward. Today most concerns are managed by young men, while the older leaders look on approvingly and sometimes wonderingly at what is being accomplished.

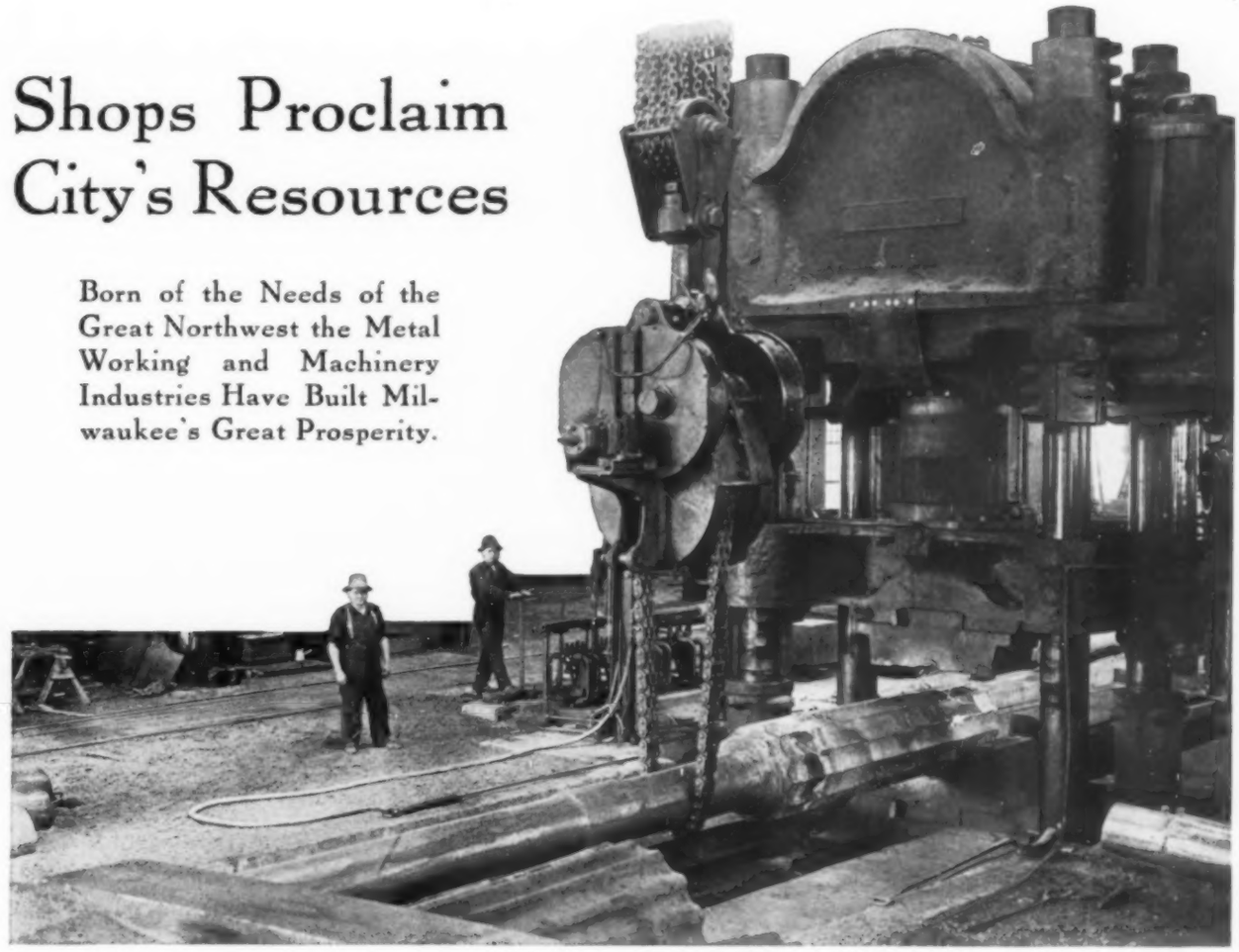
Not of least importance is a fine understanding between employers and labor. The former have been fair and farsighted in their dealings; wages have been kept high enough to keep workers content and to prevent serious disturbances. Perhaps as important a factor as any is the close association of employer, keeping their fingers on the pulse of the times, to take advantage of conditions that are approraching, meet contingencies early and keep pace with changing demands of business. By this means they have been able to obtain for Milwaukee much industry along new lines. They have been alert to seize opportunities and be in at the beginning before other cities recognized the trend of things.

Milwaukee's Metal Industry in 1917

	Firms	Employes	Wages	Capital	Products
Iron, steel machinery	97	26,082	$25,916,465	$60,839,032	$107,802,065
Elevators and cranes	4	380	360,000	609,000	1,400,000
Bridges and structural	11	1,700	1,545,000	1,725,000	8,260,000
Malleable castings	6	2,400	2,100,000	3,500,000	5,000,000
Railroad equipment	4	5,200	4,100,000	5,400,000	2,300,000
Motorcycles	1	1,618	1,445,532	1,936,433	6,064,230
Agricultural implements	6	3,500	3,150,000	6,200,000	9,460,000
Marine and shipbuilding	2	486	480,000	620,000	1,320,000
Wire goods	16	516	415,000	500,000	1,920,000
Plumbing supplies	14	1,116	1,300,000	2,100,000	4,000,000
Stoves, furnaces	7	1,540	1,200,000	3,000,000	6,100,000

Shops Proclaim City's Resources

Born of the Needs of the Great Northwest the Metal Working and Machinery Industries Have Built Milwaukee's Great Prosperity.



TOURISTS visiting one of the northwestern states in the late nineties traveled miles to a turbulent mountain stream for passage on an intrepid little steamer that braved the rushing waters and shot the rapids to furnish a thrill for those who dared the voyage. During the perilous passage the pilot who held in his hand the lives of all aboard was the center of attention. He was a splendidly built, keen-eyed Indian. He constantly scanned the tumbling rapids for hidden danger, and on occasion swung all of his supple strength agaist the wheel to avoid the seething whirlpool. Every passenger watched the stolid pilot with rapt attention and when the voyage was safely ended they cheered and threw coins into the pilot house. Forward in another pilot house, down near the deck, sat the owner of the vessel. The wheel which he manipulated was geared to the rudder, while that which the Indian handled so dramatically, was a dummy, a clever piece of stagecraft arranged to supply the romance that tourists crave. Such is good advertising. The evident is mistaken for the substance, and the klaxon is more observed than the carburetor.

So it is with municipalities. The public picks upon some evident feature, or some clever manufacturer puts forward an apt phrase which characterizes the city. Consider Milwaukee. Everyone knows what is said to have made that city famous. The brewery interests like the Indian pilot have furnished the atmosphere, and have focused attention until even the appellation "Cream City" has lost its significance. But the figurative helmsman who has made Milwaukee what it is today is the great metal working industry. Established soon after the founding of the city, it has constantly kept ahead of the growth in population until today it far outstrips any other line of the city's commercial activity.

There are at present 217 shops directly engaged in the metal working trades in Milwaukee. This figure does not include electrical shops, hardware concerns, scrap iron yards and other closely allied but divergent interests. Of this number, from extensive plants employing thousands and dealing in hundreds of tons per day all the way down the line, to the small shops producing only a few finished articles a week, practically every manufacturer is engaged in direct or indirect war work. The growth of these metal working industries in Milwaukee has a peculiar interest. The needs of the great northwest have in every case induced a response which

Why City Advances

THOUGHTLESS tourists were chugging contentedly through one of Milwaukee's beautiful parkways, conscious of the pleasure of their drive, and unmindful of a crowd which they approached. A traffic officer blocked their path with white-gloved authority and quietly called their attention to the fact that the crowd was gathered to listen to one of the daily park concerts furnished by the municipality. The city protects those who wish to enjoy the music from the unintentional discourtesy of the thoughtless. In this example of civic good manners lies the spirit of Milwaukee. Those who are in executive control today are, practically without exception, native to the city, and unless the acting head of some firm which they have themselves organized they are with the same plant through which they have won their advancement. Strikes and lockouts, while not unknown in the city's history, have been characterized by a singular absence of violence and animosity. The inate civic courtesy forms a stable basis for industrial peace and progress.

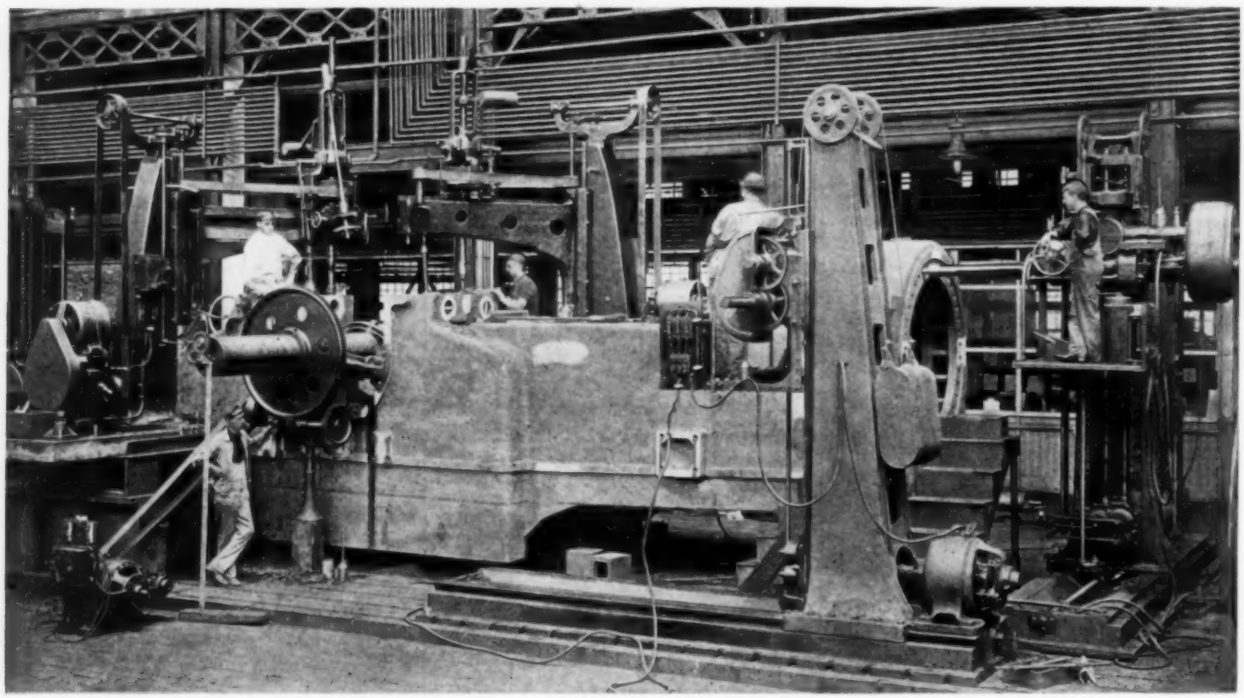
has developed some phase of manufacture.

In 1842 Egbert Mosely, Loring Dewey and Stephan Newhall came from Detroit and established Milwaukee's first machine shop. A few years later Captain A. J. Langworthy and R. G. Benedict came out from Rochester, N. Y., and established a small machine shop and foundry for making both flour and lumber mill equipment. The milling business was declining in western New York, and this fact coupled with the beginning of the western wheat development brought these pioneers to Milwaukee. Within a short time the harbor facilities furnished by Milwaukee bay and the newly established mills created a great shipping center. Farmers drove across country with their grain, coming from throughout the settled portions of Wisconsin and northern Illinois. This development in turn induced a greater growth of the mill machinery business and the firm started by Captain Langworthy and his associates became through successive expansion, the Wisconsin Iron Works and finally A. J. Langworthy & Co. This company built the first boiler constructed in Milwaukee, which was made for the "lager bier" establishment of Phillip Best. The iron for this job was brought over from Buffalo, as at that time no iron was to be had either in Milwaukee or Chicago.

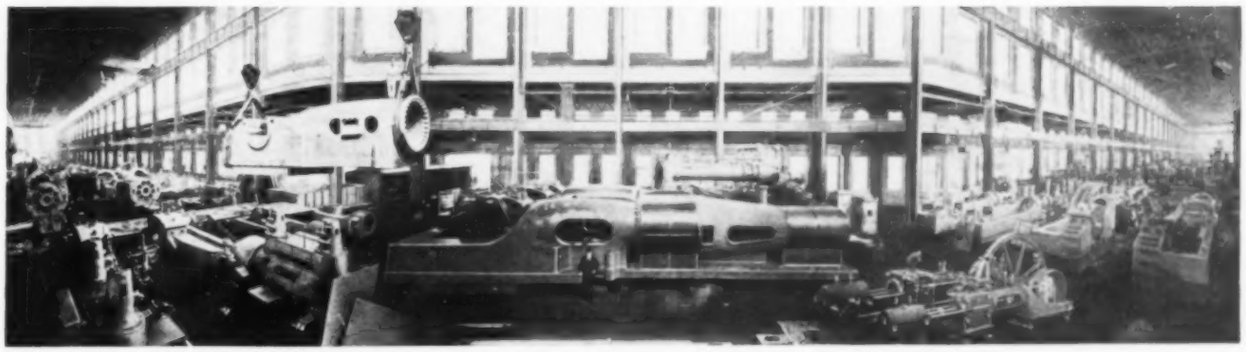
The hard times of 1857 brought reverses to the milling business and accordingly a change in incorporation and line of product was effected through the establishment of Kirby, Langworthy & Co. to build threshing machines. This firm in turn was dissolved in 1869 at the instance of one of the partners who scrupled the acceptance of the prevalent greenbacks in payment for good machinery. This pioneer firm was sold to Filer, Stowell & Co., then known as the Cream City Iron Works, and the building of milling machinery was again resumed and in fact has been continued until the present time.

The early days of Milwaukee were characterized by a steady acceleration of the metal working industry. A number of shops which have not survived to the present time were started; on the other hand, some which are today among the greatest in the country had their origin in the late forties. One, which is remarkable both for its present mammoth facilities and for the steady development which has characterized it since the beginning, was founded in 1847. Previous to that time no mill stones had been made west of Cleveland and the early flour mills brought their grinding burrs across the lakes and mounted them on Milwaukee-made machinery. The firm of Decker & Seville was the first to manufacture mill stones, and they later added a foundry and machine shop, which enabled them to build complete flour milling machinery. In 1852 they added stoves to their output, and in 1860 sold their combined business to Edward P. Allis, Charles D. Nash, and John P. McGregor, all men who were destined to become towering factors in Milwaukee's industrial life. This new firm was known as Edward P. Allis & Co., and later all interests were purchased by Mr. Allis. The foundry end of the manufacturing business developed rapidly and in 1869 the foundry known as the Bay State Works was purchased. In 1872 the construction of a new water supply system for the city offered an opportunity and on securing the contract for furnishing the mains, a complete foundry was constructed to manufacture pipe. It was not until 1877 that the first engines were built by the Allis company.

Peter Weisel who started a small shop with two machine tools and a forge in 1867 was one of the earliest builders of engines in the west. The proprietor and two workmen composed the force of this shop. Business developed rapidly and in 1874 a two-story factory building was constructed. Theo. O. Vilter, who afterwards became president of the company, started work as an apprentice under Peter Weisel. At this time the plant was producing slide valve engines, pumps, and air compressors. The Vilter family assumed control of the manufacturing business in 1878, and soon afterward commenced the



ESTABLISHED TRADITIONS DEMAND THAT THE WORK BE BROUGHT TO THE MACHINE TOOL, BUT HERE THE MAGNITUDE OF THE OPERATIONS BRING SEVERAL MACHINES TO THE WORK—FINISHING A LARGE ENGINE FRAME

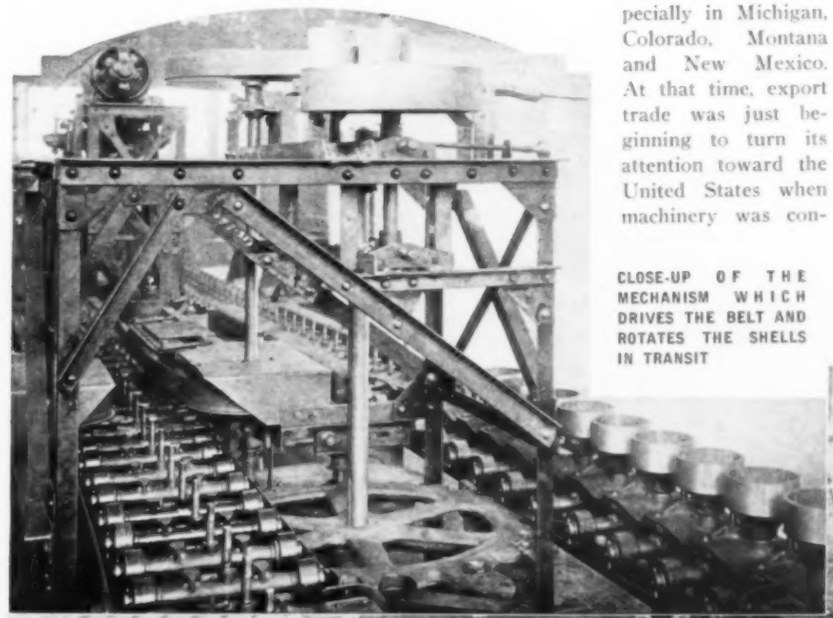


PANORAMIC CAMERAS INDUCE ODD PERSPECTIVES—THIS ONE SHOWS ONE ERECTING SHOP OF SEVERAL EMPLOYED BY THIS COMPANY. A COMPARISON WITH THE GAS ENGINE AT THE CENTER INDICATES THE MAGNITUDE OF THE SHOP

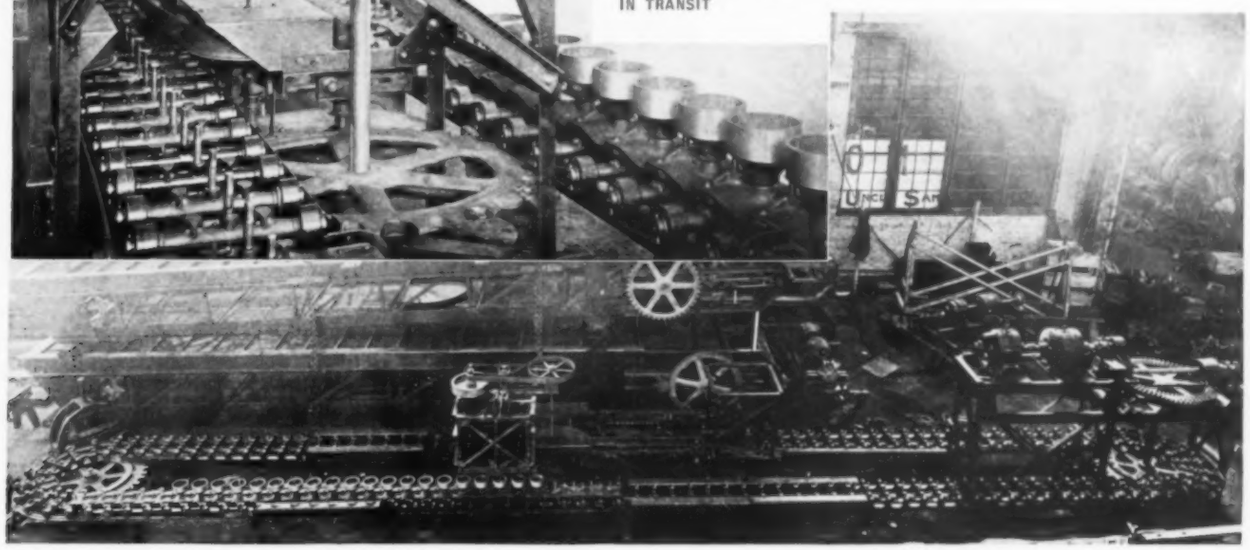
manufacture of corliss engines and refrigerating machcinery.

The steady development of the metal working industry in Milwaukee first came into the limelight about 1880, when the city began to take stock of the possibilities for the development of more varied lines of machinery manufacture. Engine building had steadily advanced. The sawmill equipment production had made such progress that in 1892 it was estimated that over half of all of the lumber producing machinery of the northwest and southwest was made in Milwaukee. At this time there were over 40 manufacturers of machinery in the city and numerous others were scattered through surrounding Wisconsin towns. In the Pittsburgh region, the great steel mills were using over 50,000 horsepower of Milwaukee built engines, while Milwaukee mining machinery was engaged in producing, handling or refining minerals, in all western states and more especially in Michigan, Colorado, Montana and New Mexico. At that time, export trade was just beginning to turn its attention toward the United States when machinery was considered, and the Wisconsin metropolis became known through the name of her manufacturers. About the same time a representative of the navy department, who was engaged in a survey of the machinery manufacturing facilities of the country, wrote a lengthy discussion of the possibilities of Milwaukee. He stated in the *New York Times* that he found machinery building capacity enough in Milwaukee to supply the entire needs of the navy for engines and auxiliary equipment.

The succeeding years have marked a steadily ascendant curve of production in all metal working lines. The first banner year was 1906, and the blow of the financial stringency during 1907 was parried by the first ten months' production which excelled all previous records. From this time until 1913 a steady growth was remarked and foreign trade played an important role. With the outbreak of the war, a slight shrinkage was felt, but with the readjustment following the government's mammoth re-



CLOSE-UP OF THE MECHANISM WHICH DRIVES THE BELT AND ROTATES THE SHELLS IN TRANSIT



A SHELL PAINTING MACHINE WHICH DOES THE WORK FOR WHICH WOMEN ARE EMPLOYED IN EUROPEAN PRACTICE—IT IS ONE OF THE VALUABLE CONTRIBUTIONS OF MILWAUKEE SHOPS TO DIRECT WAR SERVICE IN THIS COUNTRY

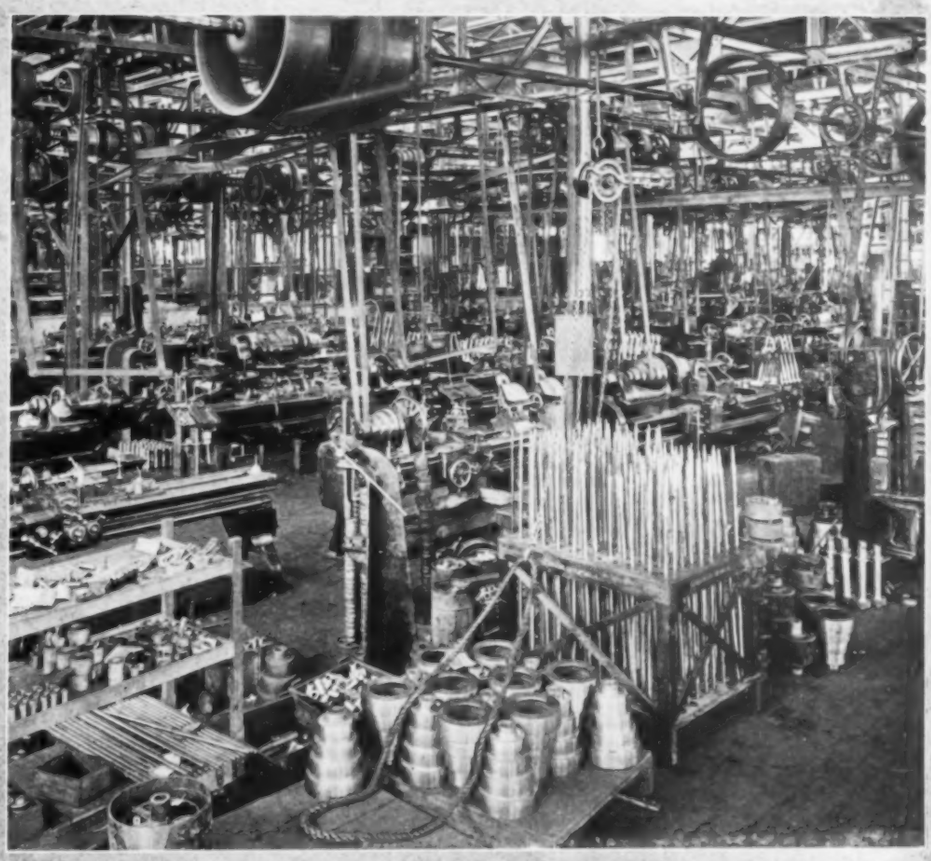
Machining propellor shafts and turbine rotor spindles for marine service.

BROAD AISLED SHOPS AIRY AND FLOODED WITH CLEAR LIGHT CONSTITUTE TRUE CATHEDRALS OF WAR INDUSTRY

Gears from single castings up to 24-feet are made in Milwaukee.

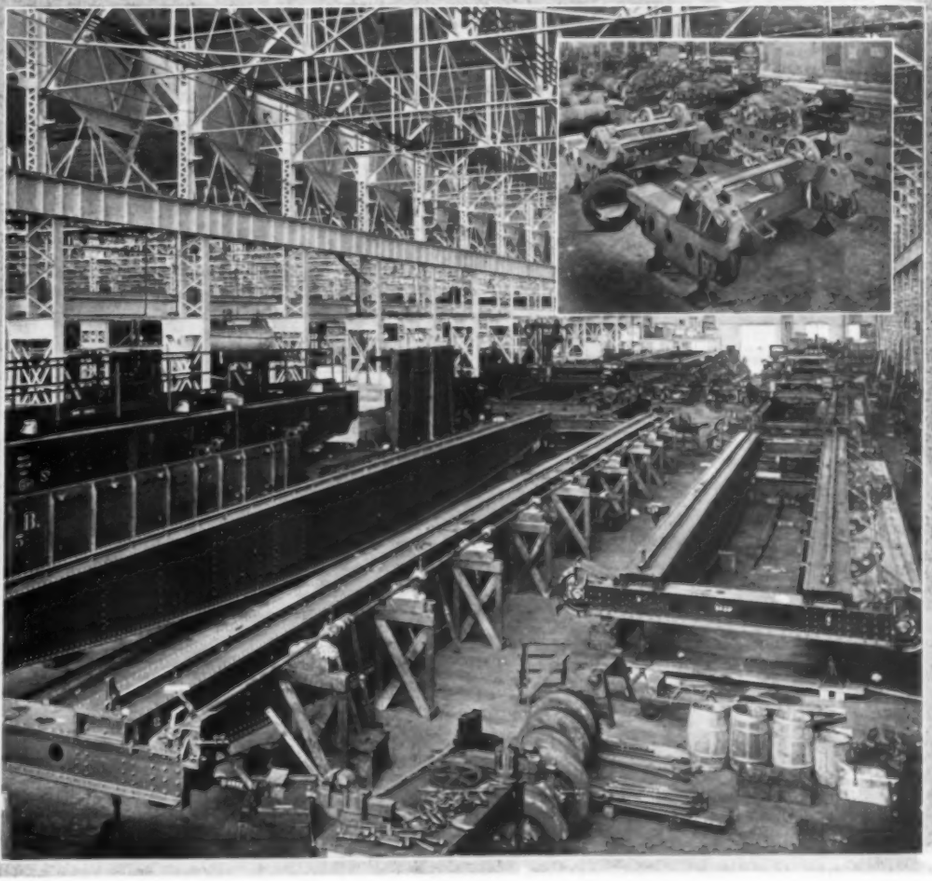
Special electrical machinery and large gears require exceptional machine shop facilities.

A multitude of machines are required to manufacture machine tools successfully.



MACHINIST AND STRUCTURAL FABRICATOR SHARE WITH THE ENGINEER THE VICTORY IN THESE INDUSTRIAL SECTORS

Crane trolleys and controls demand skilled electrical engineering.

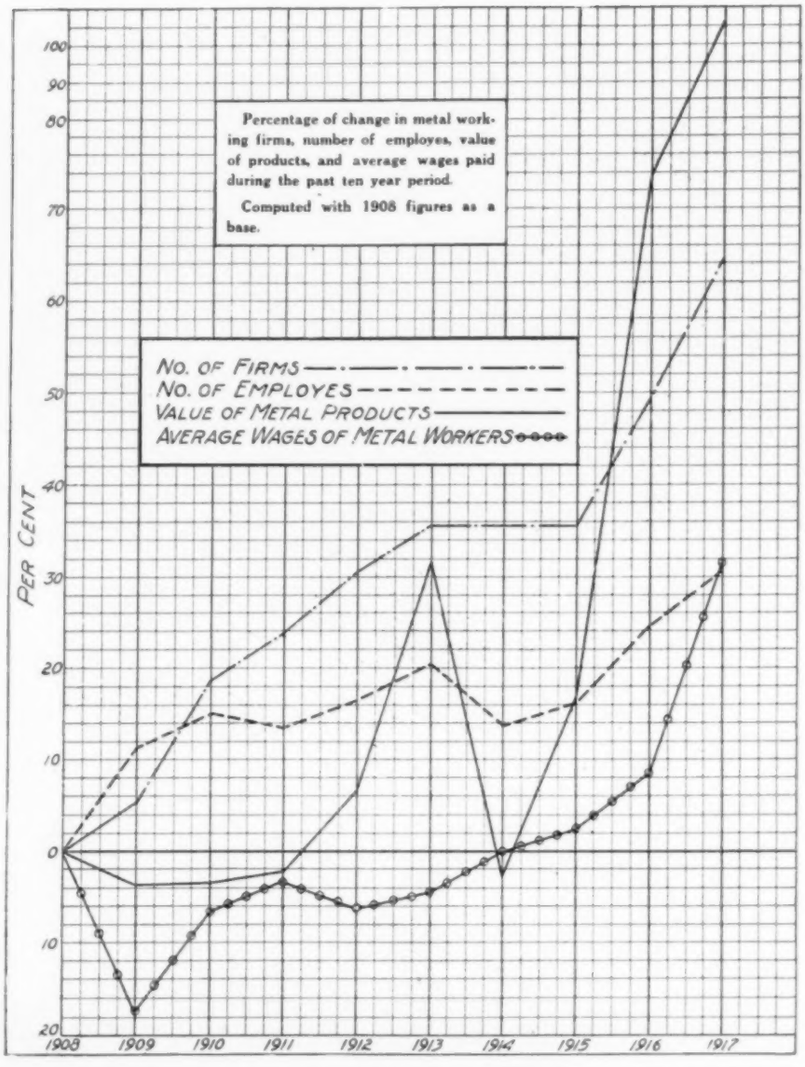


Crane builders must work to close limits of accuracy—a section of a Milwaukee crane girder shop.

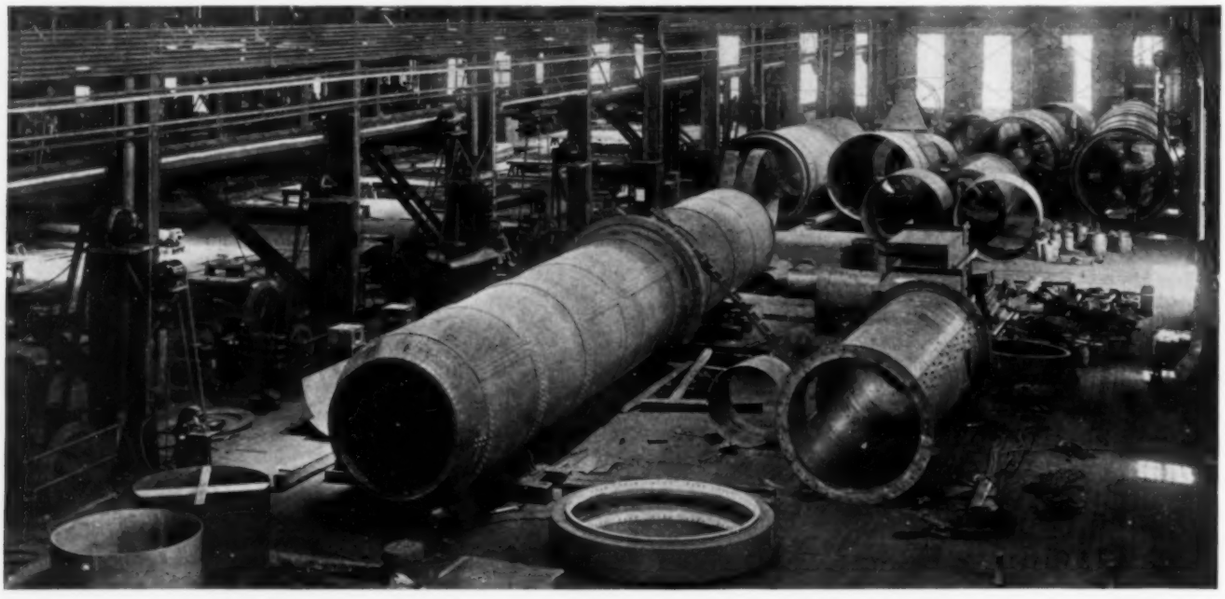
quirements, production in metal trades jumped 50 per cent in 1915-16 Milwaukee was finding her place in the world war, and filling it with credit. The increase since 1916 has been tremendous. In 1917 alone the increase in value of metal products produced by Milwaukee plants jumped from $61,633,613 to $107,802,083. The manpower engaged in this production showed a simliar remarkable increase. During this same period the number of men employed in the metal trades rose from 22,244 to 26,082. This discrepancy between increase in the number employed and the value of product is explained by the intensive production methods developed and by the energy displayed in all Milwaukee plants at the present time.

As has been stated, there are 217 metal working establishments in Milwaukee. To those who find difficulty in disassociating Milwaukee from the German stigma, a visit to any one of these thriving industries is recommended. Intelligently directed energy to the last ounce is going into machinery, equipment and supplies to wipe out in Europe all that has made German kultur a reproach. From the broad aisled machine shop turning out reduction gears for destroyers to the sixth floor die casting plant making grenade fuses, all Milwaukee industry is compounding remedies for the Hun scourge. The city has long since wiped out in tons of metal and hours of toil the bad name secured through a few misrepresentative politicians.

All of this production is not directly for war channels but the complexity



SIGNIFICANT CHANGES IN THE METAL WORKING TRADES AS COMPARED WITH THE THE STATISTICS OF 1908 AS A BASIS



EXCEPT BY COMPARISON WITH THE SIZE OF THE WORKMAN IN THE UPPER RIGHT HAND CORNER, THIS MIGHT PASS FOR A COMMONPLACE BOILER SHOP. IN FACT IT IS A MILWAUKEE SHOP WHERE SOME OF THE LARGEST BALL AND TUBE MILLS ARE PRODUCED

STRAIGHTENING ROLLS WHERE PLATES ARE PREPARED FOR FABRICATION FORM A VALUABLE STEP IN THE BUILDING OF LARGE CRANES

of modern warfare renders a casting for an Emergency Fleet turbine hardly less important than a 4.7-inch howitzer. Naturally engine and heavy pumping and mining machinery manufacture predominates in point of tonnage produced at the present time. Milwaukee excells in these particular lines of manufacture, possessing the main manufacturing plants of the Allis-Chalmers Mfg. Co., Nordberg Mfg. Co., Power & Mining Machinery Co., a subsidiary of the Worthington Pump & Machinery Corp., Filer & Stowell Co., and the Vilter Mfg. Co. In addition to these concerns which are rendering major service in equiping both fighting and merchant vessels, a number of other plants are producing special castings, bearings, oil distributing systems and parts for the same lines of war work.

Cutler-Hammer Mfg. Co., for example, is producing a tremendous amount of electrical control equipment for the Emergency Fleet and the navy.

The main plant of the Allis-Chalmers Mfg. Co. situated in West Allis, in peace times is engaged in building power machinery, including prime movers of every description, electric generators and auxiliaries, pumping machinery, sawmill equipment, flour mill, crushing, cement making mining and ore reduction equipment, and transmitting machinery. This plant which previous to the war covered over 110 acres of land with its buildings, tracks and storage yards, has been extended to take care of the volume of war business undertaken. The Allis-Chalmers Mfg. Co. was one of the first to enter the field of munition manufacture in the west, and has constantly been engaged in both direct and indirect war work since early in the great struggle. At the present time in addition to the prime war work, which includes materials and supplies for the war and navy departments, the company is producing boilers, electrical generating, transmitting and driving apparatus, pumping machinery, steel mill power units, mining machinery and equipment for both flour and lumber mills.

The propeller shafts now being made have required the construction of an entirely new heat-treating building as well as the building of special machinery for forging and machining. The heat-treating building covers a large vertical oil fired furnace which is partially beneath the ground level and which requires great head room in order that the cranes may remove the forgings from the top of the furnace. Other large furnaces are built about the forge floor. These latter admit only a portion of the ingots, for preheating before forging. Where special machinery has been required for machining the shafts, or for the large gears included in ship propulsion machinery, special machine tools have been constructed within the plant. The production of its own machinery to meet special construction problems is characteristic of the self-contained character of the company. Long association with the exceptional work, and a willingness to encounter new undertakings has developed in the organization a spirit which is invaluable in attaining results. Recently war conditions rendered it difficult to obtain the malleable iron balls required in ball mill construction. The company at once constructed its own malleable foundry and is now supplying its needs in ball castings.

The same faculty is exhibited throughout the plant. When it was necessary to produce a 24-foot special gear, a machine was built to expedite the cutting of gear teeth. Difficult problems in riveting arose in connection with the making of drums for cement mills. New riveting methods were devised. The engineering department in every case has been aided in meeting exceptional problems by the shop personnel. The policy of developing and advancing

THE COMPLEXITY OF THE MODERN MACHINE TOOL IS EVIDENCED BY THIS SMALL SECTION OF ONE OF MILWAUKEE'S LARGEST MILLING MACHINE ESTABLISHMENTS

its own men has had no small share in the exceptional success of this company.

In connection with its various departments of engineering and production, the company maintains a graduate student system which requires two years of practical shop and commercial training in different lines covered by the variety of machinery which the company builds. The principal object of this system is to educate young employes successfully to fill more advanced positions. The best of shop practice, drafting room experience and general engineering training are given the students, who are paid regularly during the progress of their course.

Cranes Are Prime Essentials

A significant feature which is at once apparent throughout the various plants in Milwaukee is the fact that practically all of them have exceptional crane facilities. Closer inspection develops the fact that almost all of the crane units are from one of the two large crane shops within the the city. The growth of these two plants has been rapid, and the exceptional demands from shops engaged in war work have caused extensive additions within the last few months.

Pawling & Harnischfeger Co.'s plant, which previous to the war manufactured a line of excavating and special handling equipment, is now concentrating upon the production of large cranes of various types. Complete girder and erecting shops, machine shops, electrical departments, a foundry and various auxiliary pattern and carpenter shops make the plant self contained. All processes entailed from the plain structural material to the finished crane, including the manufacture of electrical propelling and control equipment, are performed within the plant. A feature of the manufacturing system is the construction of every part of each hoisting unit in duplicate. One part in each case goes into the finished crane and the other, carefully stocked and cataloged, is held for emergency repair purposes. Recently the company has produced for commercial distribution a horizontal drilling and boring machine and a heavy duty drilling machine which were developed for special work in its own shops.

The other builder of hoisting and conveying equipment is the Milwaukee Electric Crane & Mfg. Co. This company was an outgrowth of the Pawling & Harnischfeger Co., and similarly has developed special designs of shop cranes. The influence of heavy war requirements has compelled the conversion of foundry space into additional assembling and machining floors, and all the castings required for trolleys and housing are now secured from outside Milwaukee foundries. This company also builds a few special lines of drilling and boring machines for sale.

Machine tool building in Milwaukee is by no means confined to the production of special machines by manufacturers for their own use, nor as a side venture to some other major production. To the machine tool trade, Milwaukee at once suggests milling machines. The Kempsmith Mfg. Co. and Kearney & Trecker Co., both with large manufacturing facilities, are engaged in producing milling machines exclusively.

The Kempsmith Mfg. Co., which is the older company, was founded in 1888 by Frank Kempsmith who disposed of his interests 13 years later. Since that time under the organization of which Paul E. Thomas is president, the plant has made a remarkable growth. The Kearney & Trecker Co. was an outgrowth of the older milling machine company, and both establishments have made great progress during the past few years. War demands have furnished a call for milling machines which these Milwaukee companies have by no means been slow in answering. Plant additions have been constructed to aid in meeting the shortage of milling machines and at present both companies confine their output to the most urgent war needs. Prior to the war, each company figured prominently in export trade, their foreign business running in the neighborhood of one-third of their output. With the cessation of this trade domestic needs have grown to the point where at the present time production is practically treble the peace time figures.

Other companies which are meeting the call for more machine tools include the Richards Machine Co., builder of drill presses; the Milwaukee Shaper Co., shapers; Universal Machinery Co.; the Luther Grinder Co., grinders, and a number of other plants which furnish jigs, dies and special auxiliary equipment for shop use.

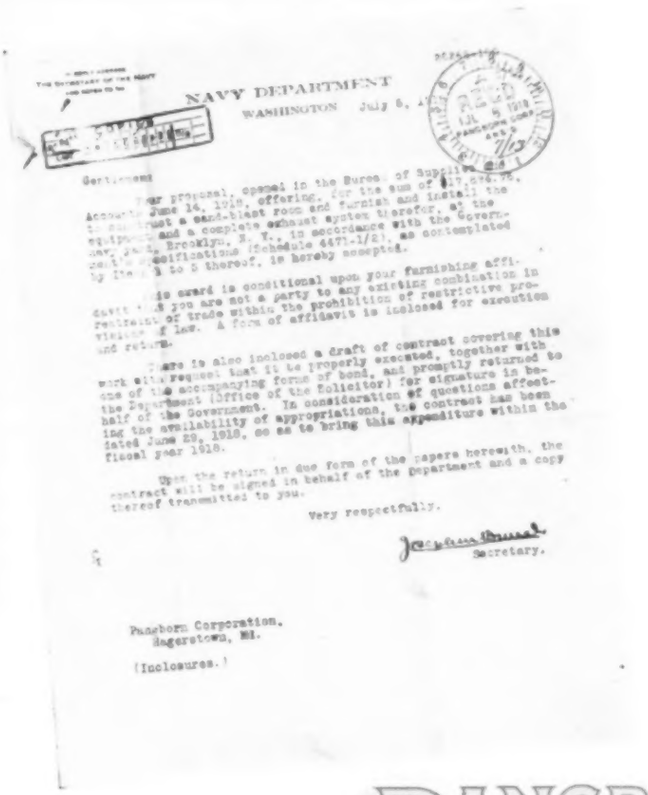
The Kaiser Shudders

When Gen. Pershing arrived in France, his engineers were faced by gigantic construction tasks. Docks, warehouses, railroads, bridges, refrigerating plants, and repair shops required equipment such as Milwaukee manufactured. These supplies have been going forward steadily. Concrete mixers, small engines, motors, tractors, trucks, stone crushers, ice making and refrigeration machinery, cranes, lever jacks, lifting magnets, structural steel, as well as the engines and machinery for ships are all being produced in quantity. These products, essential at all times, have now become vital, and Milwaukee industries are furnishing their full share. In addition, those munitions whose values are weighed in German casualties are not lacking.

Several large interests identified with successful Milwaukee manufacturing companies, pooled sufficient capital to establish the Wisconsin Gun Co. for the manufacture of 75-millimeter guns. This plant is now in full operation, and additions are under way which will double its already large production. Hand and rifle grenades are being produced by millions. These, with depth bombs, trench bombs, and airplane bombs, brass cartridge cases, trench mortars and cast shells, form an array of arms and munitions, that must make the Kaiser shudder for his erstwhile province of Wisconsin.

Shouldering the War Burden

It is particularly fortunate that early in the war, before the United States took her stand beside the allies, Milwaukee manufacturers were making munitions. The Allis Chalmers Co. was one the first among western manufacturers to engage in this work and accordingly was in position to give valuable assistance early in our armament activities. The facilities of the city proffered opportunities for the production of a great tonnage of rifle and hand grenades, and some of the large gray iron and malleable foundries were among the first to supply these missles. Brass cartridge cases naturally fell to the lot of concerns possessing forging and drawing machinery, and the numerous machine shops and electrical manufacturing companies took up the work of finishing and furnishing fuses for a wide range of grenades and bombs. The manner in which this work has been undertaken, the speed with which additions and new plants have been erected, and the whole hearted energy displayed in securing top production are the most fitting tributes to the devotion and patriotism of industrial Milwaukee. War work in the majority of instances has been undertaken through a sense of duty rather than from hope of gain. The city has not waited for Uncle Sam to be the donor of remunerative contracts, but has taken the initiative and produced results.



NAVY DEPARTMENT
WASHINGTON July 6, 1918

Gentlemen:

Your proposal, opened in the Bureau of Supplies and Accounts, June 14, 1918, offering, for the sum of $17,500.00, to furnish and install the sand-blast room and furnish and install the equipment and a complete exhaust system therefor, at the Navy Yard, Brooklyn, N. Y., in accordance with the Government's specifications (Schedule 4471-1/2), as contemplated by the [illegible] to 5 thereof, is hereby accepted.

This award is conditional upon your furnishing affidavit that you are not a party to any existing combination in restraint of trade within the prohibition of restrictive provisions of law. A form of affidavit is inclosed for execution and return.

There is also inclosed a draft of contract covering this work with request that it be properly executed, together with one of the accompanying forms of bond, and promptly returned to the Department (Office of the Solicitor) for signature in behalf of the Government. In consideration of questions affecting the availability of appropriations, the contract has been dated June 29, 1918, so as to bring this expenditure within the fiscal year 1918.

Upon the return in due form of the papers herewith, the contract will be signed in behalf of the Department and a copy thereof transmitted to you.

Very respectfully,

Secretary.

Pangborn Corporation,
Hagerstown, Md.

(Inclosures.)

ARE Your Specifications and Requirements more exacting than Uncle Sam's?

Devices for every Sand-Blasting operation, from the simplest to the most complete System designed and manufactured in the Largest Plant in the World that is devoted exclusively to the production of

Sand-Blast and Allied Equipment.

Your requirements will be handled as an individual problem with experience and facilities that are unequalled.

We can satisfy the United States Government, Why not you?

Visit us at the Foundry Convention
Spaces 210, 211, 212.
Machinery Hall.

PANGBORN
CORPORATION
HAGERSTOWN, MD.
SAND-BLAST SPECIALISTS
P.O. BOX 858

NAVY DEPARTMENT.
WASHINGTON. 24502-141
S/Ls/Mm

June 29, 1918

Gentlemen:

Your proposal opened in the Bureau of Supplies and Accounts, June 11, 1918, offering for the sum of [illegible]74 to furnish and deliver at the Navy Yard, Norfolk, (Portsmouth) Va., in accordance with the Government's specifications (Schedule 4471-1/2) as modified by your letter dated June 19, 1918, (Proposal 25054) is hereby accepted, it being understood that you are to furnish the services of an experienced erecting superintendent to supervise and direct the installation of said equipment by the Government.

Form of contract and bond covering this work will be sent to you at an early date for execution.

Very respectfully,

Acting Secretary

Pangborn Corporation,
Hagerstown, Maryland.

INDUSTRIAL DEPARTMENT
UNITED STATES NAVY YARD
NORFOLK, VIRGINIA

NDH

15985-56-9

Pangborn Corporation,
Hagerstown, Md.

JUL 26 1918

Gentlemen:-

Mr.S.W.Brinson, Asst.Shop Superintendent [illegible] Yard, states that he visited your plant on July 16, [illegible] Mr.Brinson recently made a trip covering thirty (30) [illegible] plants in different parts of the country, and states that you have one of the most delightful and best plants which it has been his pleasure to visit.

Please accept our thanks for the courtesy shown and the information given to Mr.Brinson at that time.

Very truly yours,

Naval Constructor, U.S.N.,
SHOP SUPERINTENDENT.

PANGBORN EQUIPMENT MAKES THE BEST INVESTMENT
"ASK THOSE WHO KNOW BY WORKING COMPARISON"

He is Fighting for US!

He's a "Yank"—and perhaps he belongs to you or me—son or brother, maybe. And he isn't going under or around—he's going right through—he's heading straight for Berlin!

THAT shows the quality of sand HE has.

And you and I are going to continue to do all we can to help him. It's up to you to make castings; we'll furnish the "sand"— the kind that means success every time—the kind that will let you make perfect castings.

Then let's get together right away.

THE PORTAGE SILICA CO
Youngstown Ohio

MEET US AT MILWAUKEE

PORTAGE SANDS will allow your molders to produce their utmost, with the least effort, in the shortest time. They have been used for many years with the greatest satisfaction.

PORTAGE STEEL MOLDING SAND averages over 98% Silica. PORTAGE SAND BLAST SANDS are clean, hard, sharp and uniform.

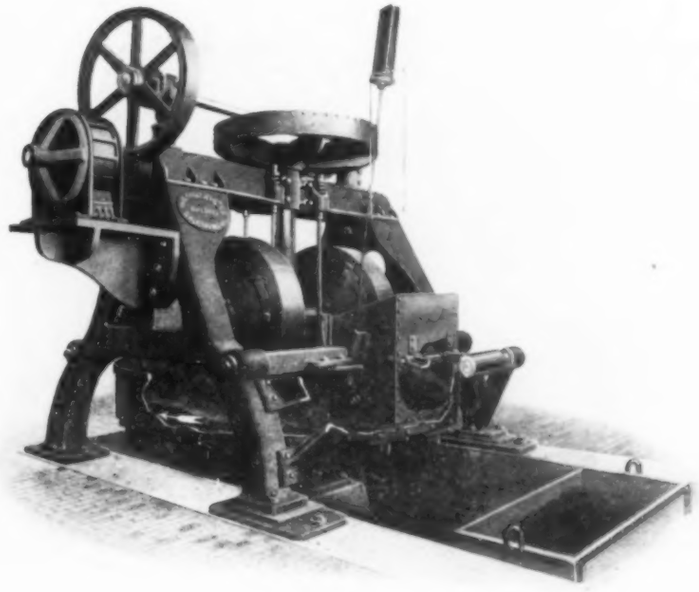
We would like to send you our little booklet which illustrates and describes our methods of producing Portage Sands.

Write Us.

ITB

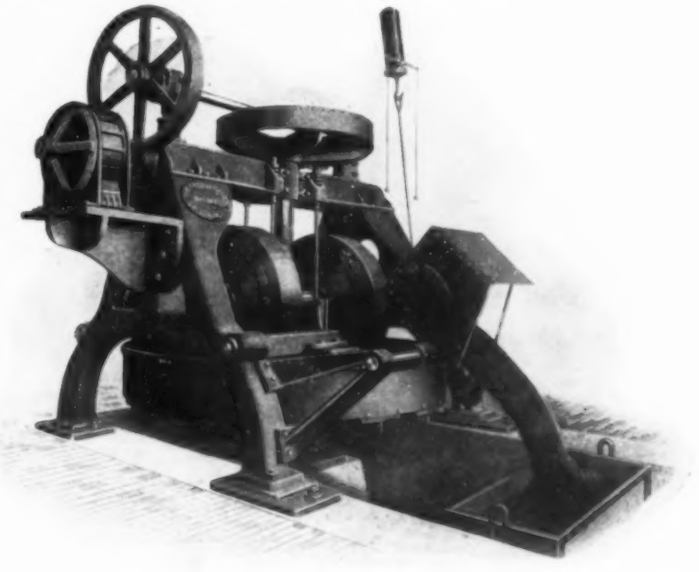
Say you saw it in THE IRON TRADE REVIEW

Frost Wet Pan Sand Mill For Steel Foundries



Bucket Filling

A batch mill having one air valve to control the entire operation of dipping the mixture from pan and dumping into the pit. Very heavy mullers. Revolving pan. Large capacity. Motor or belt driven. Mullers suspend on springs allowing adjustment. Chilled removable muller rims also chilled grinding plates. It is correctly designed.



Bucket Dumping

The Frost Manufacturing Company

Works: Galesburg, Ill.

General Sales Offices:
112 W. Adams St., CHICAGO

Our Government Urges Kawin Service Teaches

"CONSERVATION"

The Director of Pig Iron requests the utmost conservation in the use of Pig Iron, specifying in some industries that not over 50% of their mixture shall be Pig Iron and "Remelt Scrap," which means in many Foundries the Pig Content of the Mixture will be from 35% to 20%, and to seek help from a 'Chemist' if need be in readjusting their mixture. The

CHARLES C. KAWIN COMPANY

Are more than 'Chemists'—they are Experts on

Mixtures—Moulding—Cupola Practice

They have a corps of Trained Foundrymen backed up by a chain of Five Fully Equipped Laboratories with [ask them] years practical experience in all phases of Foundry Practice.

WHY NOT ENLIST IN OUR ARMY OF FOUNDRYMEN

1903
Charles C. Kawin
One
Laboratory

Dayton Laboratory
Established 1906

Toronto, Can., Laboratory
Established 1908

SERVICE
KAWIN

San Francisco Buffalo
1914—Established—1917

Engineering Department
Established January 1, 1918

1918
5 Laboratories
Chicago, Ill.
Toronto, Canada
San Francisco, Cal.
Dayton, Ohio
Buffalo, N. Y.

1918
Foundrymen
Engineering Dep't.
Special Laboratory
Physical Testing

Attention-getting Interest-compelling

MOTION PICTURES

—visualize your sales talk
—supplement your publicity
—increase your orders
—decrease your selling costs
—recruit your labor
—instruct your employes

Rothacker FILM MFG. CO. CHICAGO U.S.A. *Industrial Motion Pictures*

Shortest, Easiest Route to an Order!

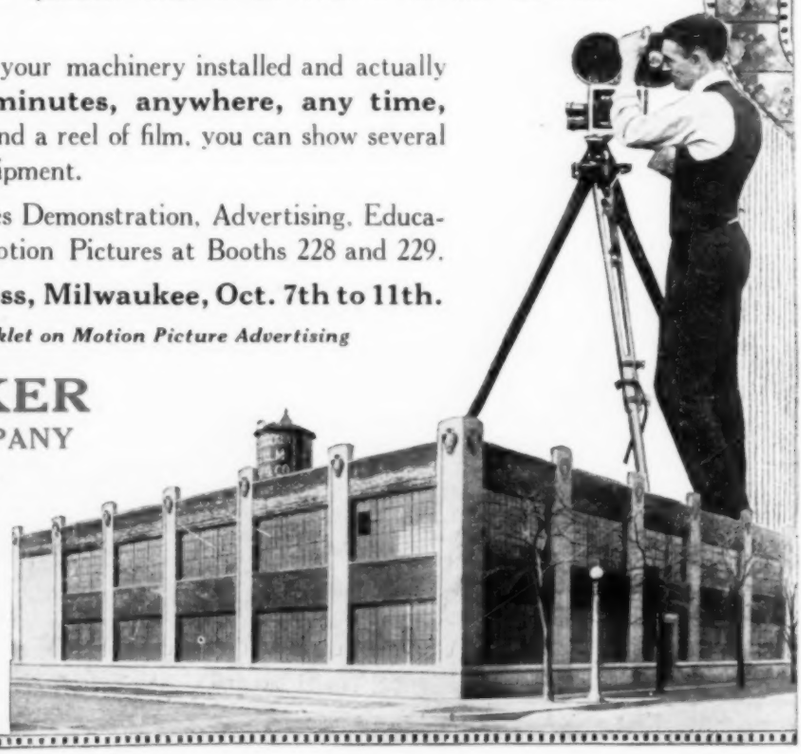
The shortest, easiest and quickest route to an order is via the "show-me" Motion Picture path.

Use motion pictures of your machinery installed and actually working. In **fifteen minutes, anywhere, any time,** with portable projector and a reel of film, you can show several installations of your equipment.

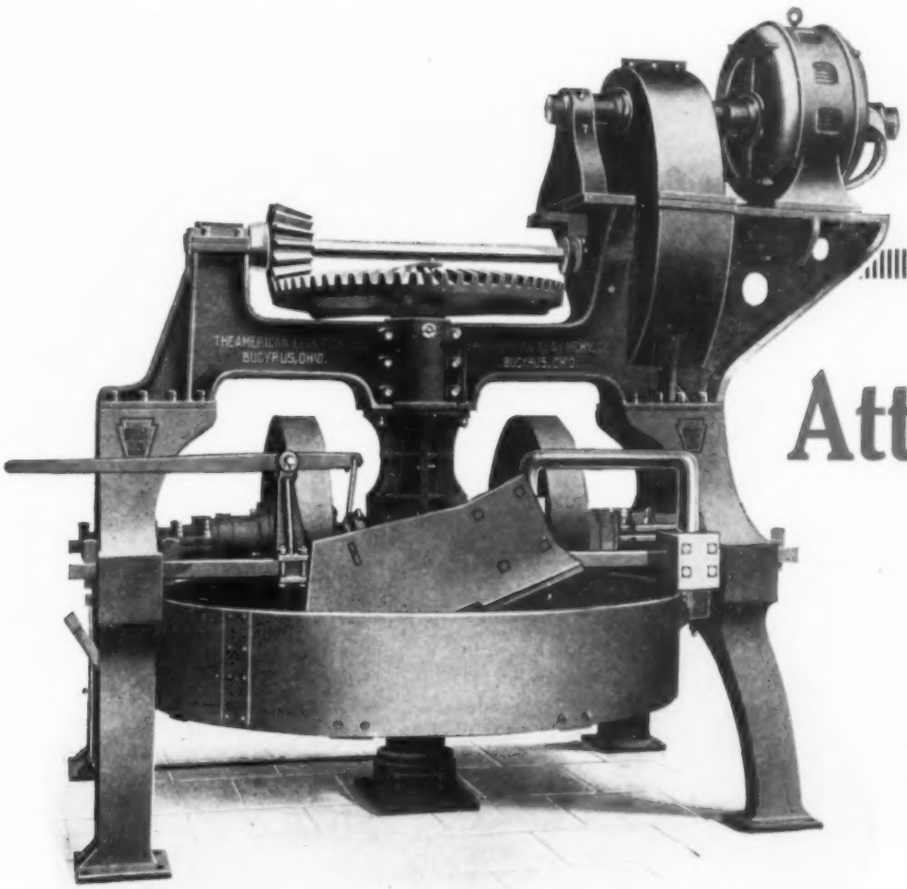
Daily Exhibitions of Sales Demonstration, Advertising, Educational and Industrial Motion Pictures at Booths 228 and 229.

Allied Metals Congress, Milwaukee, Oct. 7th to 11th.

Write for Free Booklet on Motion Picture Advertising



ROTHACKER
FILM MFG. COMPANY
WATTERSON R. ROTHACKER,
President
1339 DIVERSEY
PARKWAY
CHICAGO,
ILLINOIS
U. S. A.



Attention!

Steel Plants,
Blast
Furnaces;
Foundries,
Brickmakers

American Grinding Pans

Reclaim worn out furnace lining material; core sand and facings. They grind ganister and fire-brick at a saving of 75% over methods that are much less effective.

Send for comprehensive Catalog and prices—both will prove interesting reading.

BUILT RIGHT RUN RIGHT

American Clay Machinery Company

BUCYRUS - - OHIO

BUILT RIGHT RUN RIGHT

Say you saw it in THE IRON TRADE REVIEW

STOP PECK LOOK

PRESSED STEEL FLASK

LISTEN

A Better Flask in Every Respect. Greater Rigidity Because — the corners, instead of being reinforced, are acetylene welded inside and out, the inside being built up with an acetylene welded fillet, making a corner that is practically indestructible. Because—each cope and drag has one or more ribs (depending on the depth) running lengthwise of each side and end plate. Because — the top and bottom of each cope and drag are flanged forming a sand strip and strengthening both sides and ends.

YOU'LL SEE IT IN MILWAUKEE

Approved by Uncle Sam.

Altho the Peck Pressed Steel Flask is a comparatively new product we have already filled several direct orders from the U. S. Government and are now working on a large contract order for them.

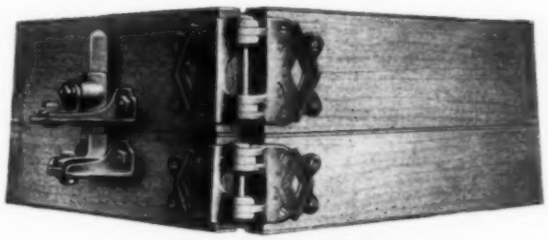
We also manufacture steel flask bands, steel slip jackets, tote pans, core plates and loading skips.

Write for particulars.

Peck Iron & Steel Works
Kalamazoo, Mich.

MASTER FLASK General View

MASTER FLASK—Latch View



MASTER FLASK—Hinge View

JACKET
Style "I" Taper

JACKET Style "E" Straight

THE MASTER FLASK

The MASTER FLASK incorporates in its construction the most advanced ideas in snap flask building. All of the weak points and defects common in other types have been eliminated, thereby placing this flask on a plane of perfection.

Malleable iron fittings are used throughout, with the exception of the pins and sockets which are grey iron. Selected air dried cherry and maple are used in construction of these flasks. The corners are machine locked, dipped in glue and held in a press until set. To further strengthen the corners they are bound with pressed steel angles. Each flask is finished with three coats of shellac and thoroughly inspected before leaving the factory.

An altogether different type of latch, pin and socket and hinge have been produced.

They are designed for rapidity and precision of operation, combining also strength and rigidity.

The latch which is of the drop type, can either be placed on the left or right hand corner. The engagement is very rapid and effective, as the cam on the lever draws the flask tighter together as it engages. Ample hand hold is provided for on the lever insuring ease of operation.

The pin and socket is designed to overcome difficulties encountered in match plate work or any other job that may have a difficult lift. The adjustable features make them adaptable to either straight or taper flask without the use of shimmers. The bearing surface of the guide is long, the angle being 60 degrees instead of 90; together with the ball and socket adjustment, this insures a perfect lift, eliminating any possible shake encountered when lifting the cope from the drag.

The lugs of the hinge have large bearing surfaces and are interlocking. They are accurately milled and fitted together, eliminating all strain, insuring ease in opening and closing the flask.

Twenty-two of these flasks are in operation at a malleable iron foundry in our vicinity undergoing a very rigid test. They have shown excellent results and have enabled this foundry to greatly increase production. Rifle grenades are being produced for the government by this firm and the work must be turned out with rapidity and precision.

We also manufacture a complete line of metal jackets, bands and other foundry equipment. We welcome with pleasure all inquiries, and our catalogs are waiting to be placed into interested hands.

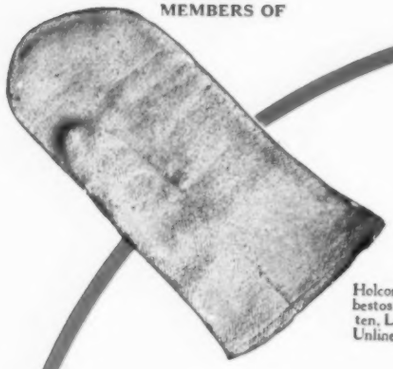
DIAMOND CLAMP & FLASK CO.

38-40 N. 14 St.

RICHMOND - - INDIANA

MEMBERS OF

NATIONAL SAFETY COUNCIL



Holcomb Asbestos Mitten, Lined or Unlined.

Holcomb Asbestos Long Mitten, Lined or Unlined.

Greater Safety

One way of solving the labor shortage problem is to obtain greater efficiency from the help you now have. This can be done by the use of proper safety devices.

Greater Safety means fewer accidents and more efficient results.

HOLCOMB SAFETY GARMENTS

are made especially for the protection of employes in ***iron, steel*** and ***brass foundries*** or wherever acids, molten metal or heated articles are handled.

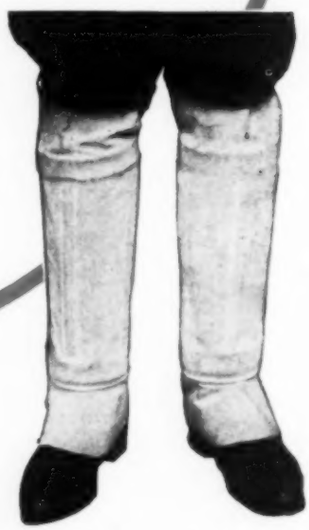
Let us help you solve your labor shortage problem—send for our catalog.

Holcomb Safety Garment Co.

14 SO. JEFFERSON STREET
CHICAGO, ILL.

Holcomb Leather Snap Button Leggin, can be adjusted for any fit.

Holcomb Asbestos Glove, lined or unlined.



Molder's Spring Knee Leggin easily put on, can be removed in an instant.

Which

STOCO SAFETY GOGGLE

Stoco Safety Goggles cost $9.00 a dozen—with interesting discounts for quantity orders. At the lowest possible estimate it is several hundred times cheaper to provide every man in your employ with a pair of Stoco Safety Goggles than to have one of them lose an eye.

If you go shopping for eye protection you may find some one who will sell you more goggles per dollar than we will, but you cannot buy more protection or greater durability per dollar anywhere. Stoco Safety Goggles will make every pair of eyes in your factory absolutely safe for an indefinite period—we have never heard of one of our Protection glasses wearing out.

The Stoco Safety Goggle is practically indestructible. It has no soldered joints to come apart, no screws to work loose and fall out. When lenses become pitted they may be readily changed by anyone without the aid of special tools. Being constructed entirely of german silver, the Stoco Safety Goggle will not rust or corrode from the action of perspiration and may be sterilized daily in any manner desired without damage.

Eyes are safe behind the Stoco Safety Goggle. The lenses are ground from optical glass especially selected for its strength. The one-piece front prevents particles entering between the eyes—an ever present danger with goggles lacking this exclusive feature. Perforated metal side shields provide effective protection against rivet heads, metal or stone chips and other missiles.

We shall be glad to send interested responsible people a sample of the Stoco Safety Goggle on receipt of request on letterhead or accompanied by business card.

STANDARD OPTICAL COMPANY
GENEVA, NEW YORK

FOR FOUNDRIES
LAKEWOOD
INDUSTRIAL HAULAGE
Help the Crane
"Your overhead crane has more work than it can do. Continual delays result. Deliveries of new cranes delayed.
Part of the Crane's work can be done by a Lakewood Industrial Haulage System. Confine the work of the crane to lifting. Do the hauling by means of a Lakewood Industrial Haulage System.
Possibilities such as this are considered by Lakewood Engineers when they are asked to assist in solving Haulage problems.
Complete Haulage Systems
Storage Battery Tractors—Trucks—Trailers—Electric Locomotives—Cars—Track.
Link up with Lakewood
Lakewood Engineering Co., Cleveland
FACTORIES
LAKEWOOD GALION CHICAGO HEIGHTS WEST PARK MILWAUKEE ELYRIA
ALLIED
ALLIED CONSTRUCTION MACHINERY CORPORATION
Export Department
120 Broadway New York, U.S.A.
ALLIED
LAKEWOOD
INDUSTRIAL HAULAGE
FLAT WHEEL
FLANGE WHEEL

1854 — 1918

Yesterday—Today and Tomorrow

CURTIS & CO. MFG. CO., our parent concern, was established in 1854, seven years before the beginning of the Civil War. Forty years later, in the early Nineties, we began manufacturing our present line of Curtis Air Compressors, Curtis Air Hoists, Cranes and Single I Beam Trolleys. In 1905, it was necessary to purchase the present site for a new and enlarged plant.

Today this plant covers nearly twenty acres, employs over two thousand men and is a nationally known organization. During all of these years of steady, conservative growth, we have been crystallizing our policy, building our organization, keeping our eye on the future, and our success today is a reflection of our methods in the past.

Our total effort now is in the first and foremost duty of war work; in fact, we are one of what might be called "America's Volunteer Industries" who have been so engaged since the very date of America's entry into this great struggle.

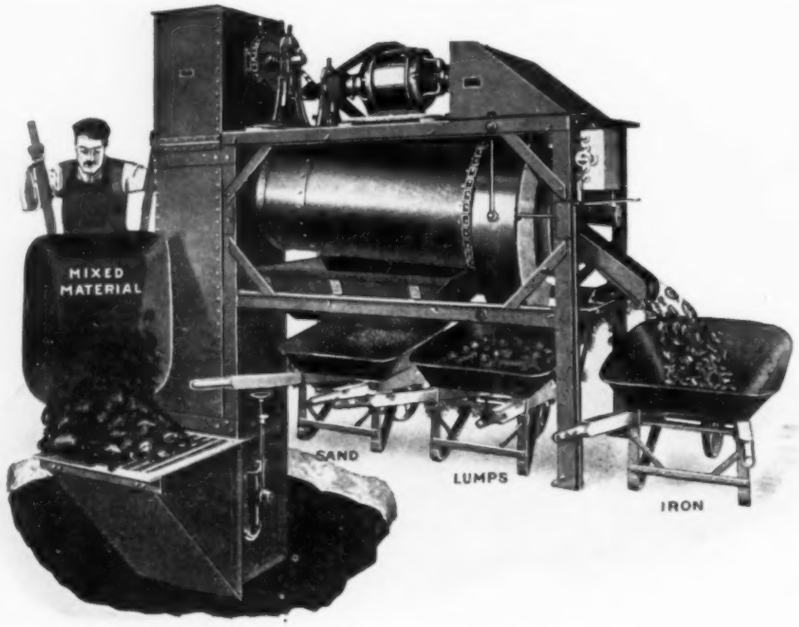
We are still manufacturing our regular line. Curtis product, however, is reserved for Government requirements and essential industries exclusively, and, as a result some of our normal trade outlets and some of our very good customers must necessarily suffer to a certain extent. We know that our customers will take pride in feeling that any such sacrifice is not in vain, that the condition is but a temporary one, and that in the golden years to follow, CURTIS will again be at your service with renewed vigor, a larger experience, added facilities, a still more efficient organization and the pride of victorious accomplishment.

Curtis Pneumatic Machinery Co.

1501 KEINLEN AVENUE

SAINT LOUIS, U. S. A.

NEW YORK OFFICE - - - - 30 CHURCH ST.



TYPE "F" MAGNETIC SEPARATOR WITH ELEVATOR FOR USE IN IRON AND STEEL FOUNDRIES

DON'T
Throw Away Good Metal

Ask For Bulletin No. 28

Save The Metal By Using A Type "F" Magnetic Separator

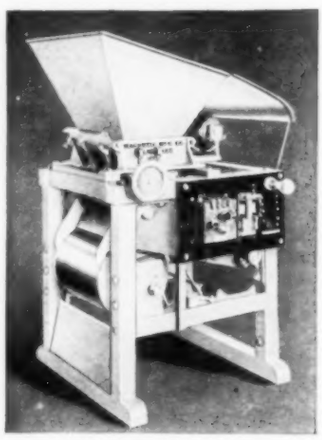
They Conserve Labor, and Save Every Particle of Iron That You Have Been Carrying to the Dump.

No shoveling is required. The material is dumped into the elevator grizzly. The sand is screened, ready for reuse, and the iron is extracted from the refuse.

The TYPE "L" Separators

Have no Equal for Large Capacities and Clean Products

Ask for Bulletin No. 30

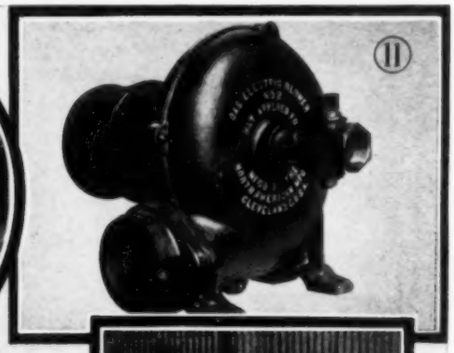


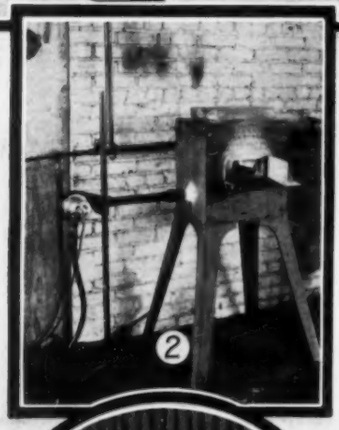
TYPE "L" MAGNETIC SEPARATOR FOR BRASS AND ALUMINUM FOUNDRIES

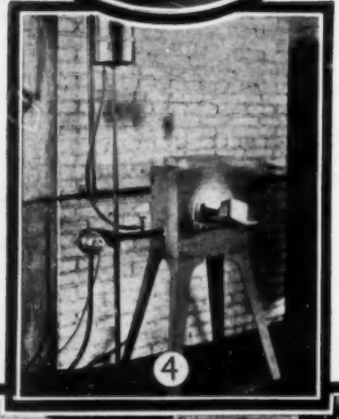
MAGNETIC MFG. CO.

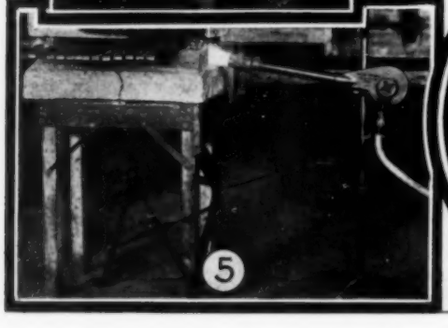
770 Windlake Ave. MILWAUKEE, WIS.

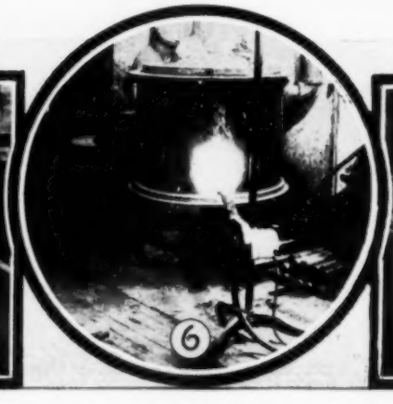
ABOVE ALL COMPETITION
DINGS
DINGS MAGNETIC SEPARATOR CO.
MILWAUKEE, WISCONSIN.
Over 2,500 Now in Operation

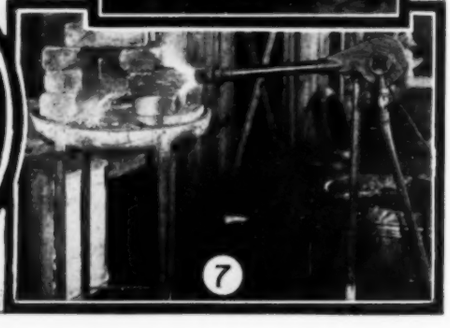












Saving Time and Money the "NAAB" Way

Study the illustrations:

Nos. 1 and 11 are views of our **No. 2 Blower** for use with hardening, heat treating, annealing and melting furnaces. It can also be used for heating Core Ovens, Bake Ovens, Japanning Ovens, etc.

No. 2 is our Gas-Electric Blow Torch applied to a small hardening furnace. Temperatures from 200 to 2500° Fahrenheit can be maintained.

No. 3 shows our Naab Gas-Electric Blow Torch straightening a shaft in lathe centers. The flame may be adjusted in length and the temperature regulated to meet conditions.

No. 4 is the Naab Oil-Electric Furnace Burner. Burns kerosene oil, fuel oil, natural or manufactured gas—or a combination or both and gas without change.

No. 5 is the Naab Gas-Electric Blow Torch used as an improvised bar heating furnace. Bars are heated and bent at the rate of 85 an hour.

No. 6 is the Naab Gas-Electric Blow Torch applied to melting furnace, reducing approximately 500 lbs. zinc spelter in 30 minutes.

No. 7 shows a coal forge converted into a gas forge by using the Naab Torch and a few fire brick.

No. 8 shows the Naab Gas-Electric Torch heating ends of heavy springs for bending into shapes.

No. 9 Preheating a casting before welding with a Naab Gas-Electric Torch. Saves 50%.

No. 10 An improvised furnace being heated with a "Naab".

No. 12 Preheating a ladle with a "Naab".

Write us at once for full details.

North American Mfg. Co.

(Successors to Naab Mfg. Co.)

5902 Carnegie Ave. CLEVELAND, O.

SPEED UP PRODUCTION

Welding and Cutting Supplies

Oxygen
Nitrogen
Acetylene
Regulators
Carbon Burners
Calcium Carbide
Acetylene Generators

AIRCO

Gauges
Goggles
Tank Trucks
Blow Pipes
Cutting Torches
Welding Torches
Welding Rods and Fluxes

AIRCO AIRCO AIRCO AIRCO AIRCO AIRCO

War demands maximum production and economy

We supply the means for increasing production and decreasing waste

Start now, in the right direction by investigating the Airco Process

Save your defective castings and prepare for emergency repairs

See our exhibit during the Allied Metals Congress - Milwaukee

Send for full information if unable to attend convention

SERVICE QUALITY SERVICE QUALITY

AIR REDUCTION SALES COMPANY.
120 Broadway, New York, City

San Francisco
Oklahoma City
Kansas City
Cleveland
Baltimore
Defiance
Atlanta
Buffalo
Detroit

AIRCO

Philadelphia
Minneapolis
Cincinnati
Pittsburgh
Chicago
St. Louis
Brooklyn
Boston
Dallas

KEEP CYLINDERS MOVING

Say you saw it in THE IRON TRADE REVIEW

It stirs Every American heart

Who was not thrilled to read of the American soldier who supported a wounded comrade, and fought his way with the little detachment back through the Boches to the American lines?

That is only one deed of heroism among the many happening every day and looked on as a matter of course by the boys fighting for us over there. It shows the stuff that's in them. They are our own sons and brothers. Is the same stuff in us over here?

We have the opportunity at home to show our patriotism by other deeds of valor. We can fight and we MUST fight. And we must WIN, no matter how heavy our burdens may be.

Our former habits are the Huns we've got to battle with. We can't go on living as we used to. We can't go on spending our money for things we like. We must set up new standards—war standards—and stick to them —loyally.

From now on there can be only one standard for those of us who fight behind the lines—by saving and lending

We must Buy Bonds to our utmost

This Space is Contributed to Winning the War by

THE STOWELL COMPANY

Established 1893

Founders and Manufacturers

South Milwaukee, Wis.

Why You Should Investigate the Ludlum Electric Furnace

Ludlum Electric Steel Furnaces are Designed to operate from power lines of any voltage or frequency.

Hearth and Roof Construction scientifically designed makes furnace of high thermal efficiency and low power consumption.

Steady and Smooth Running without heavy power fluctuations.

Low Refractory Costs, due to properly shaped and proportioned parts with no overhanging walls when pouring.

Low Electrode Cost due to efficiency of furnace and shortness of exposed electrodes.

Low Labor Costs, brought about by accessibility of hearth, ease of sintering new linings, and automatic control.

THERE are many reasons why the Ludlum Electric Furnace is pre-eminent. But they are not paper reasons—not merely "talking points." It is simple enough to frame up a list of claims, and to display them boldly upon all occasions. But it is a different thing to back them up with mechanical *facts*.

We *know* what the Ludlum Electric Furnace will do. It is not a question of claims, but of a simple statement of facts. And in your own interest we ask you to give us the opportunity to demonstrate that they *are* facts.

It will be a pleasure to show you the Furnace at the Allied Metals Congress, and to demonstrate its superiority of design and construction. We will show you figures and data to substantiate the facts which are here stated. We will give you every opportunity to judge whether it might not save you time and money in your own plant.

Will you give us the opportunity to demonstrate to you the facts which are set forth in the left hand column, and to satisfy you that the Ludlum Furnace is, as we claim for it:

Rugged Economical Efficient

LUDLUM ELECTRIC FURNACE CORPORATION

2 RECTOR STREET NEW YORK

24 E. JACKSON BLVD. CHICAGO

DEMOCRACY

Executive Mansion, Washington, November 21, 1864.

Mrs. Bixby, Boston, Massachusetts.

"Dear Madam: I have been shown in the files of the War Department a statement of the Adjutant-General of Massachusetts that you are the mother of five sons who have died gloriously on the field of battle. I feel how weak and fruitless must be any words of mine which should attempt to beguile you from the grief of a loss so overwhelming. But I can not refrain from tendering to you the consolation that may be found in the thanks of the Republic they died to save. I pray that our Heavenly Father may assuage the anguish of your bereavement and leave you only the cherished memory of the loved and lost, and the solemn pride that must be yours to have laid so costly a sacrifice upon the altar of freedom."

Yours very sincerely and respectfully,

A. Lincoln

Buy Liberty Bonds

Fourth Liberty Loan, Sept. 28th Oct. 19th 1918

MORGAN CONSTRUCTION CO.
WORCESTER, MASS., U.S.A.

AUTOCRACY

Nineteen-Eighteen

Frau Meter;—

"His Majesty the Kaiser hears that you have sacrificed nine sons in defense of the Fatherland in the present war. His Majesty is immensely gratified at the fact, and in recognition is pleased to send you his photograph, with frame and autograph signature."

Buy Liberty Bonds

Fourth Liberty Loan, Sept. 28th Oct. 19th 1918

MORGAN CONSTRUCTION CO.
WORCESTER, MASS., U.S.A.

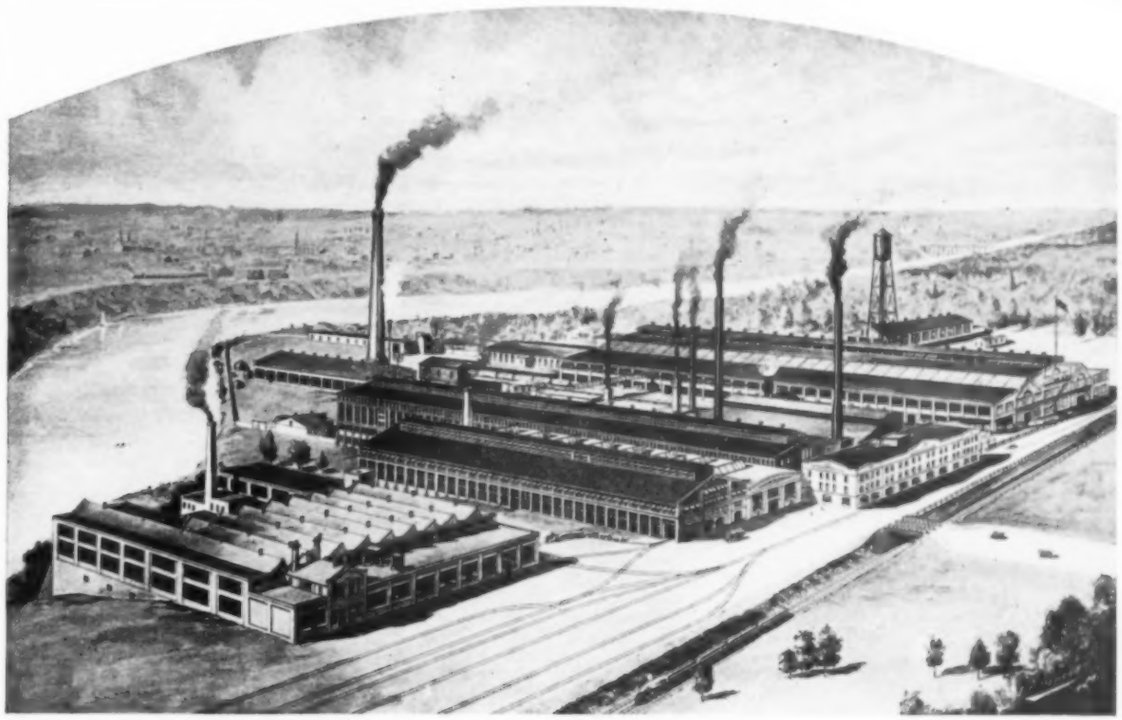
Malleable Castings
for
Agricultural Implements
and
Railroad Equipment

If you desire castings of unusual strength, density, heat resisting and wearing qualities, send us your blueprints.

We will guarantee to furnish you castings free from blemishes, scale or shrinkage cracks and made to specified tensile or transverse strength tests.

Let us figure on your requirements.

Lakeside Malleable Castings Co.
RACINE, WISCONSIN



NATIONAL BRAKE & ELECTRIC COMPANY

MILWAUKEE *WISCONSIN*

SUBSIDIARY COMPANIES

National Steel Foundries
Milwaukee Locomotive Mfg. Co.

Manufacturers of

Air Compressors	*Open Hearth Steel Castings*
Air Brake Equipments	*Grey Iron Castings*
Gasolene Locomotives	*Four Wheel Drive Tractors*

Say you saw it in THE IRON TRADE REVIEW

Geo. H. Smith
STEEL CASTING
COMPANY

The Original Makers of

DYNAMO
STEEL

Analysis

Manganese, trace; Carbon .07 per cent; Silicon .10 per cent.
This steel is practically *Pure Iron.* It is the best material for DYNAMO and MOTOR FIELD RINGS, as it has the highest Permeability.

Blue Print of Magnetic Permeability Curve sent on Application. We also make high grade Automobile Castings, Manganese, Vanadium and other Alloy Steel Castings, and Castings for General Machine Work.

Pattern Shop in Connection

CHICAGO OFFICE—Room 1657 Conway Building

Milwaukee, Wis.

FARRELL

STEEL CASTINGS

Made To A Higher Standard

A casting is made or marred *before the metal is poured into the mould.*

Pouring is the culminating operation of a series of more important operations, every one of which has a direct bearing on the final result.

Farrell Steel Castings are preferred by many of the largest users of steel castings in this country (as well as the smallest), because our experience, knowledge and foundry facilities together produce castings of a uniform higher quality and greater dependability.

Are *you* interested in better steel castings?

We can not serve you *now*, but after the war we would like to talk it over with you.

The Farrell-Cheek Steel Casting Co.
Sandusky, Ohio

Makers of Steel Castings that are a Little Better than the Next Best.

Say you saw it in THE IRON TRADE REVIEW

PELTON STEEL CO.

The latch string is out
during the Convention week.

The address is Chicago Avenue
and Elliott Place, Milwaukee.

Who Are We?

We are producers of.

Three hundred tons of steel castings of quality
(weighing ½ pound to 500 pounds) per month.

Specification steel to meet all tests.

Commercial steel of the highest grade.

We operate two electric furnaces.
We are keen on prompt deliveries.
Our prices are correct.
Our trade mark is a test bar, signifying quality.

Come in and see us—

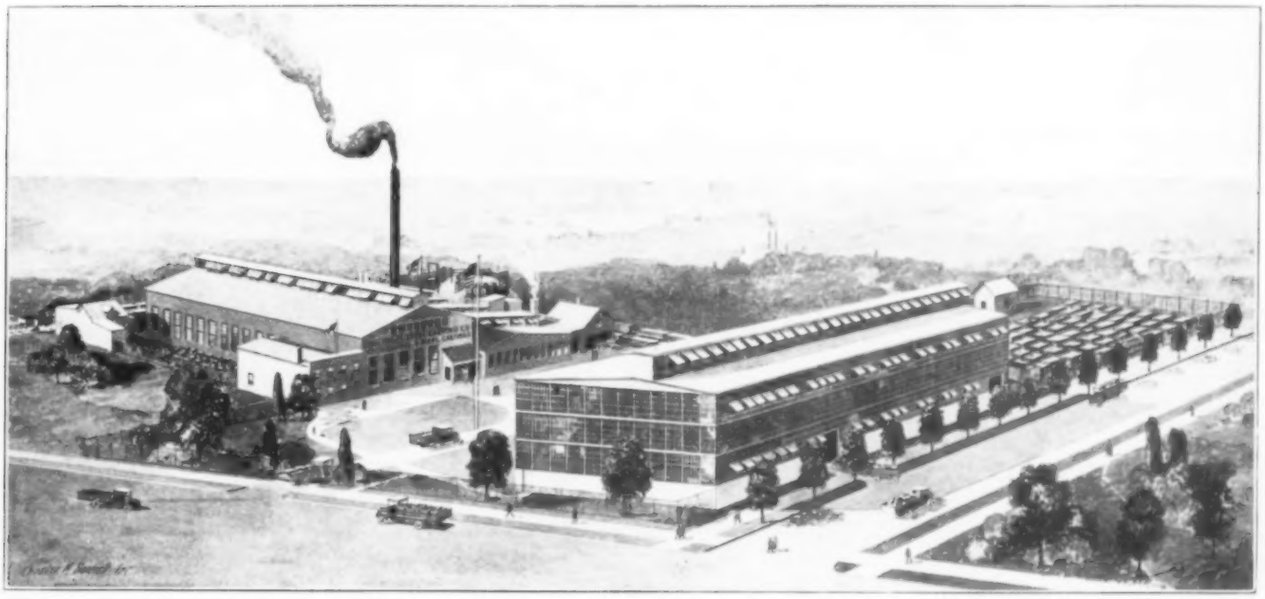
ELECTRIC STEEL CASTINGS

The new additions at our modern foundry are now ready for inspection. We cordially invite Milwaukee's Allied Metals Congress guests to visit our plant. Our additions consist of a new core room 30' x 100' and a new foundry 80' x 190' in which will be installed one of the most modern electric furnaces made. These additions will increase our daily output to 20 tons per day of ***highest quality Electric Steel Castings***. The number of men in our employ is 175.

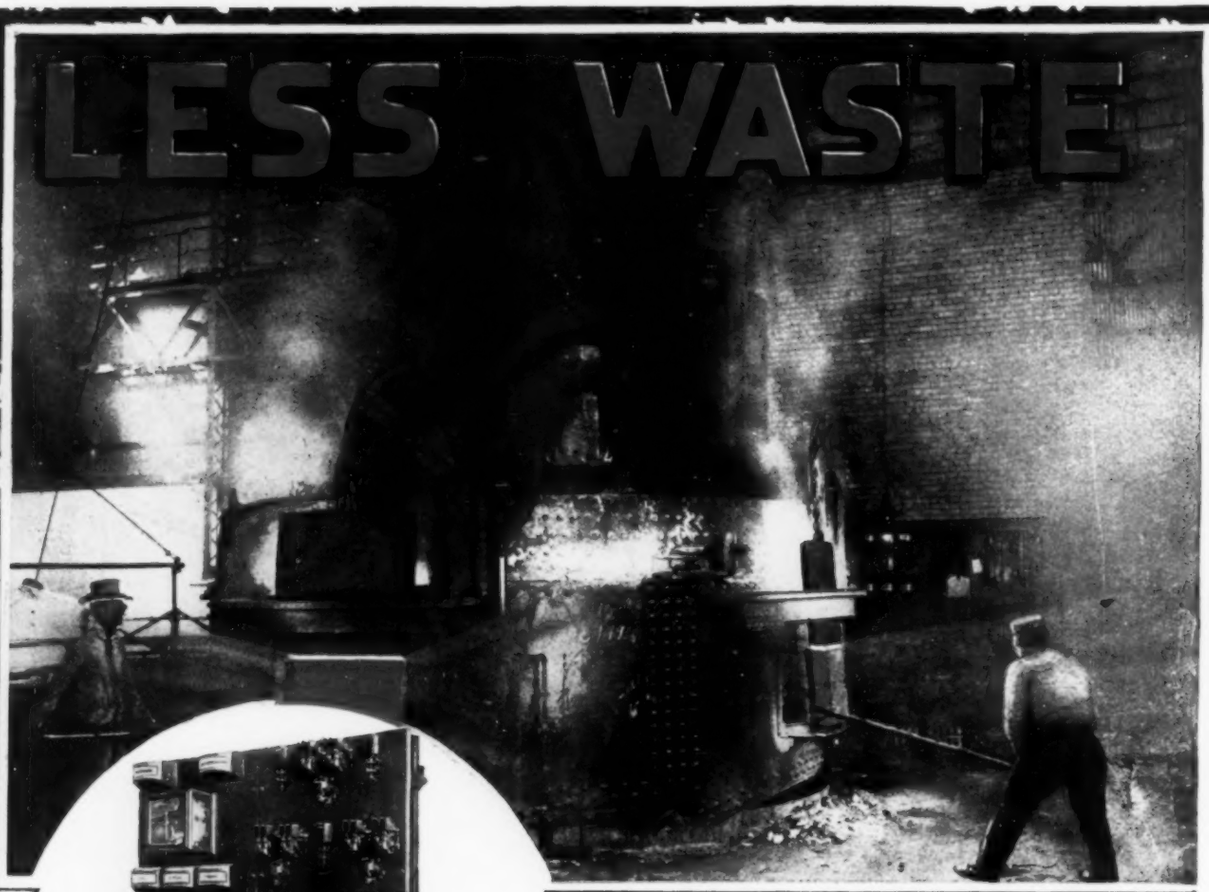
Come in and let us demonstrate what our seventeen years of foundry practice can do for you in the Electric Steel Casting line.

Gerlinger Steel Castings Co.

MILWAUKEE, WISCONSIN



Say you saw it in THE IRON TRADE REVIEW



Primary and Secondary G-E Control Panels.

Save steel by assuring highest quality every heat.

Exact temperature control every heat has been obtained by electric arc furnaces using G-E Automatic Control. It is now possible to forecast with accuracy the chemical and physical characteristics of the steel and thus eliminate wastage.

G-E Automatic Control for steel furnaces assures close power input control and electrode movements, without continuous racking of the entire mechanism.

The G-E Automatic Control operates just as successfully on furnaces making ferro-alloys, carbides, abrasives, etc., as on furnaces making steel and in all cases assures maximum production per kilowatt hour input.

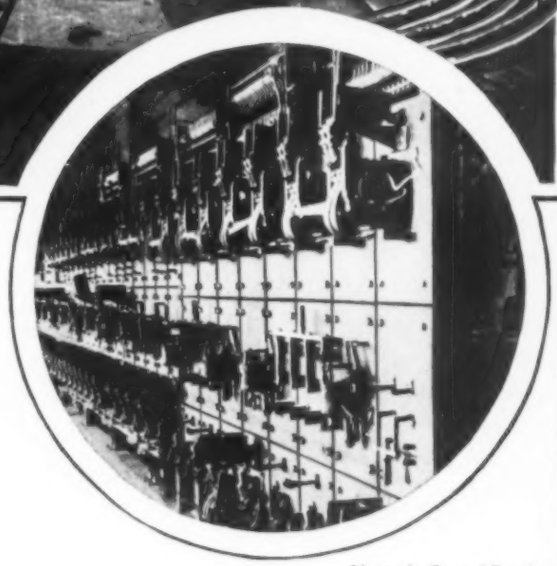
Let our engineers show you how this equipment will save steel, fuel and labor.

Ask for Bulletin No. 48710—AUXILIARY APPARATUS FOR ELECTRIC FURNACES.

GENERAL ELECTRIC COMPANY

GENERAL OFFICE: SCHENECTADY, N.Y.

43-69



Magnetic Control Panel for Rolling Mill

Save steel by using exact speed control for rolls.

The ability to roll any given section at its correct speed means a more uniform product, increased tonnage and less waste of steel.

Adjustable speeds, each constant under varying loads, are being obtained in scores of large steel plants by using G-E Control equipment. This equipment permits the rolling at normal motor speed of much of the average mill's output. This reduces all power losses, wear and depreciation to a minimum.

Made doubly effective by the element of surprise, every ton of steel rolled now takes the place of tons rolled later.

GENERAL ELECTRIC COMPANY

GENERAL OFFICE: SCHENECTADY, N.Y.

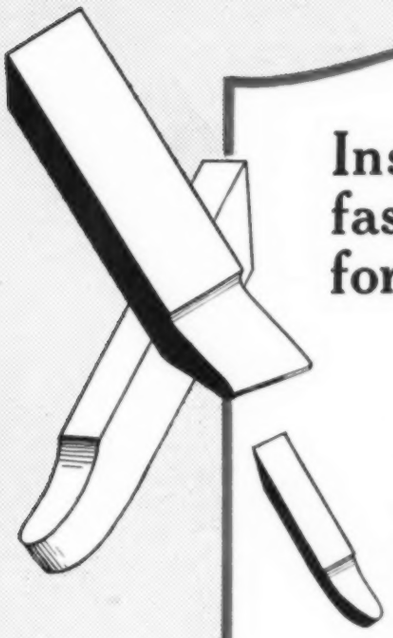
43-A-27

NORTHWESTERN MALLEABLE IRON CO.

Makers of dependable malleable iron since 1882

MILWAUKEE, WIS.

URANIUM
HIGH SPEED STEEL



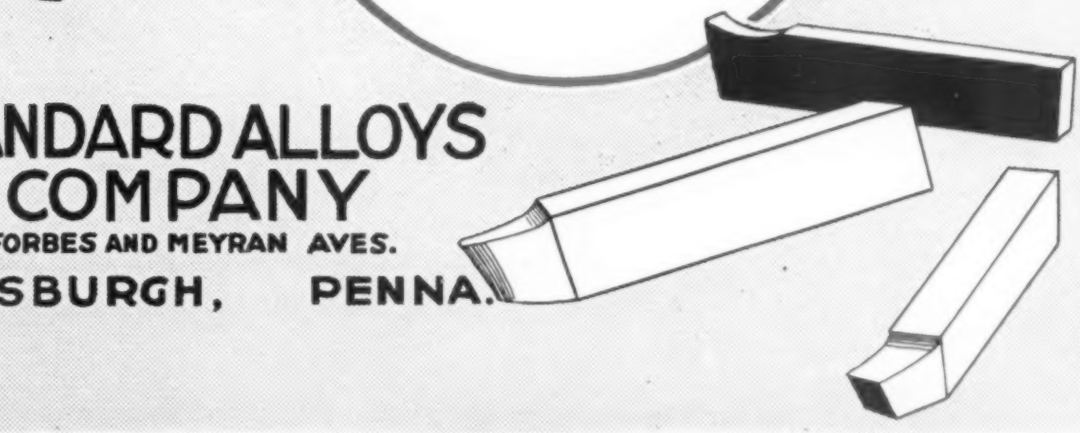
Insures less grinding, faster and deeper cutting for all your tools

You must economize on labor as well as on material, if you would obtain maximum efficiency from your plant.

Labor shortage is becoming a more serious problem every hour—so serious that every minute your men spend on the grinding wheel is vividly reflected by production shortage.

Reduce the amount of time spent on non-productive work in your plant and increase your production by using Uranium High Speed Steel.

Consult your steel man or write us



STANDARD ALLOYS COMPANY
FORBES AND MEYRAN AVES.
PITTSBURGH, PENNA.

ELECTRIC FURNACE
Alloy and Tool Steels

INGOTS—Forging and Rolling—4" to 35"

PRESSED BILLETS
4" to 16"

ROLLED and HAMMERED BARS
Annealed or Heat Treated

ALLOY STEEL DIE BLOCKS
Annealed

HIGH SPEED and CARBON TOOL STEELS

General Steel Company

Public Service Bldg. Milwaukee, Wis.

The Sivyer Service of providing Electric Steel Castings has for its objects the decrease of machining costs and the increase of wearing-quality and life. Both are attained by methods which result from long experience and begin with the design of the casting itself. When we find that a casting we are asked to furnish is of a design not consistent with good foundry practice, we study its function in the completed unit and offer the necessary suggestions to make it a really practicable casting job without affecting in any way its function and efficiency.

Secondly, Sivyer Service analyzes the functions of the casting and specifies the proper composition steel for the job; long experience with carbon and alloy steels has enabled us to reduce costs and increase quality remarkably for many different industries.

Thirdly, Sivyer Service makes a careful study of the pattern and molding problem involved, for improper gating and insufficient risers are often the greatest wasters of machining labor and metal.

SIVYER S CASTINGS

Fourthly, Sivyer Service analyzes carefully the proper annealing methods to be used and controls their proper application through unfailingly efficient equipment and men. In short, the Sivyer Service supervises every step necessary to secure unusually and unfailingly good castings of electric steel. It never relies on one factor alone, relies very little even on the natural freedom of electric steel from occluded gases and on its commonly recognized merit in resisting crystallization. It also depends but little on the inherent scientific accuracy of the electric furnace process. From casting design to sand blasting and tumbling, the fundamental superiority of Sivyer Steel is due to its men and metal. Their value is best proved by the fact that, although the production of steel castings is generally looked upon as a local one, the Sivyer market is national.

THE scientific mixing of sands and oil is a small but important part in keeping the surface of Sivyer Castings free from the pinholes and dirt which make machining difficult and costly.

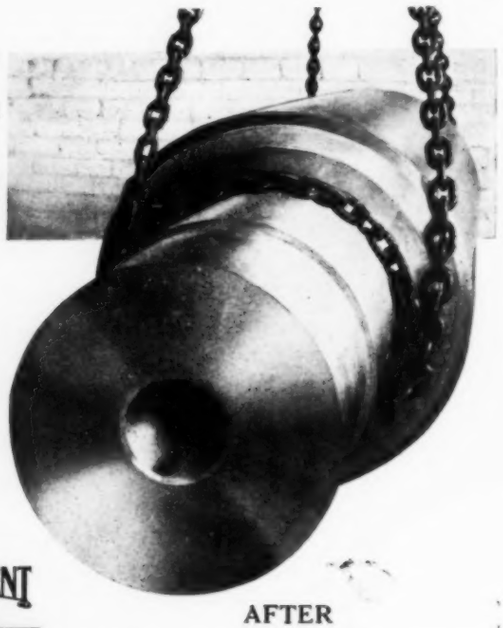
It is still more important because it provides for that proper escape of gases from the cooling metal so essential — even with electric steel — in keeping the interior of the casting free from the imprisoned gases which, in ordinary castings, cause many losses in machining, and cause even more distressing failures in actual service.

SIVYER STEEL CASTING COMPANY, MILWAUKEE

SIVYER STEEL

WHAT WOULD YOU DO ?

SAVE $300.00 or LOSE IT?

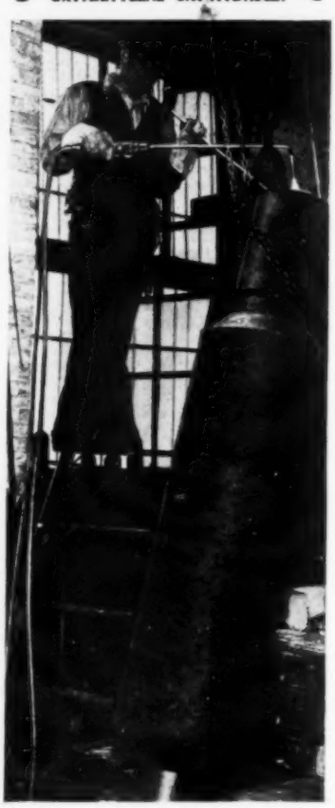


BEFORE

Here is a big semi-steel roller, weighing 4500 lb., with the machining almost completed. When cut off, the end was found full of blow holes—hundreds of dollars' worth of time and material ready for the scrap pile; or would have been if an Imperial Torch had not been on the job. The shaft was up-ended and new metal added, absolutely over-coming the defect in a few hours.

There is scarcely a manufacturing process today, involving the working of metals, wherein the oxy-acetylene welding or cutting cannot be utilized in lessening the cost, increasing the output of the product and eliminating big losses of time and materials.

IMPERIAL WELDING CUTTING EQUIPMENT
OXY-ACETYLENE · OXY-HYDROGEN



DURING

AFTER

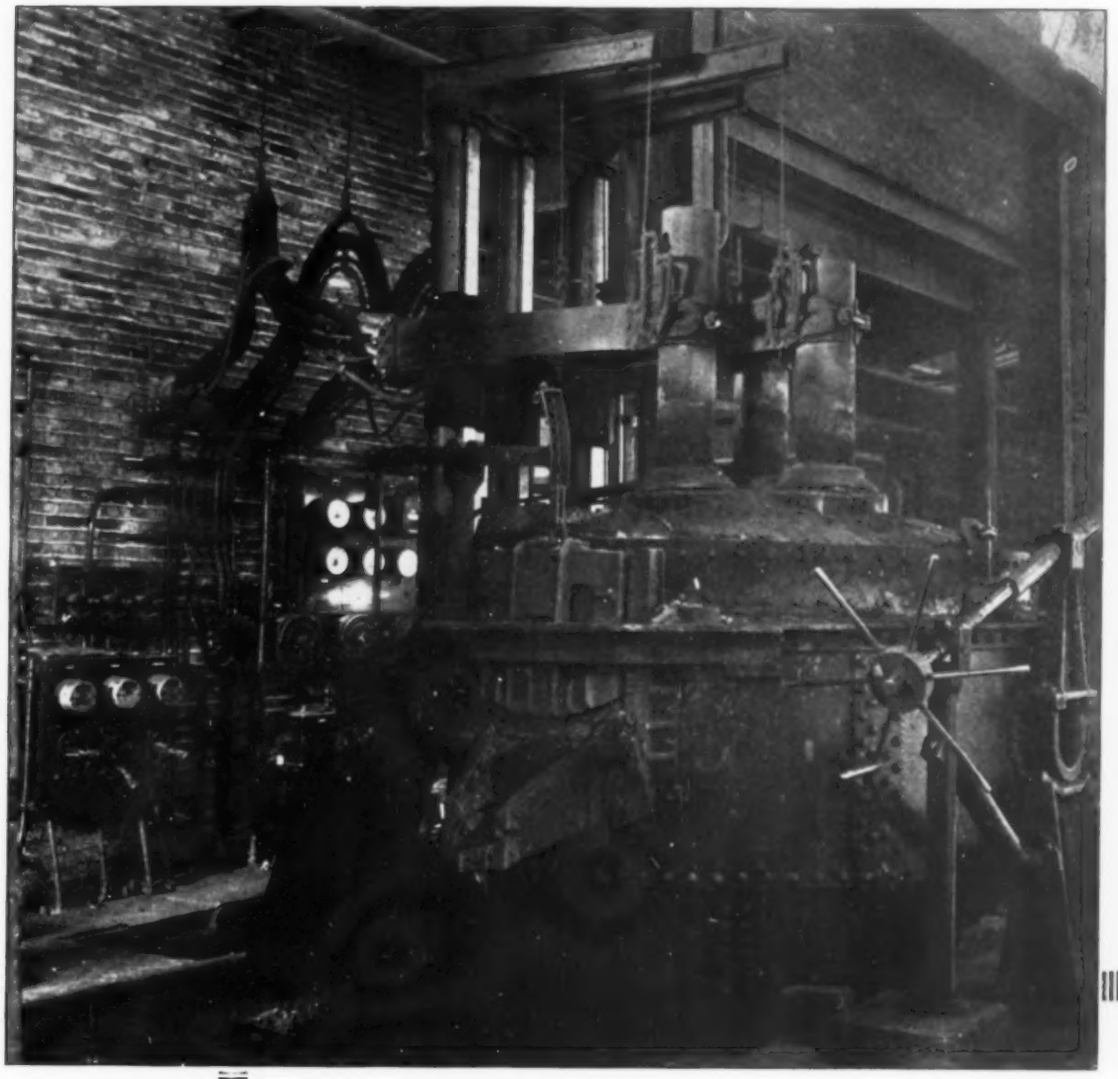
No repair shop or general machine shop is completely or most efficiently equipped if it is without an **Imperial Oxy-Acetylene Welding and Cutting Equipment.**

The oxy-acetylene flame is not only an effective repairer but a builder. It makes joints and seams of solid metal—permanent, invisible, strong as the metal before welding.

In these days of intensive production you cannot afford to wait days or weeks with your machines idle, waiting for repair parts. Write for full details of this wonderful "First-Aid" to crippled machinery and reasons why you should choose **Imperial Equipment** above all others.

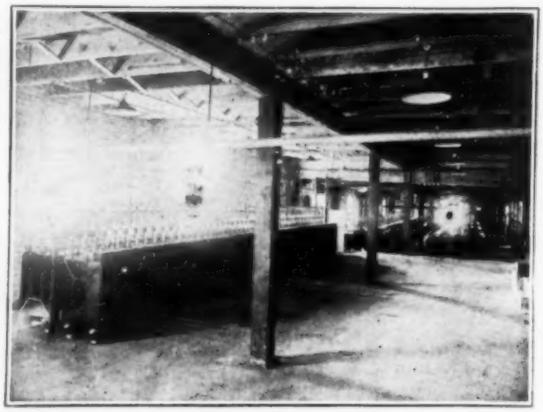
THE IMPERIAL BRASS MANUFACTURING COMPANY

1200 W. Harrison St., CHICAGO, ILL.

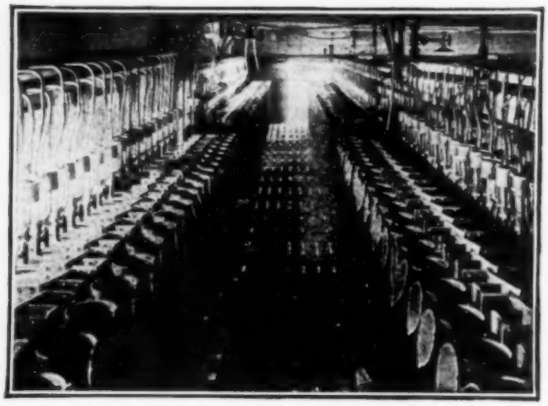


ELECTRIC FURNACE
Steel Castings

MAYNARD ELECTRIC STEEL
CASTING COMPANY
MILWAUKEE WISCONSIN



Bettendorf Oxygen Hydrogen Co., Bettendorf, Iowa.
Operate 200 Levin Generators.



The General Electric Co., Erie, Pa., operate 300 Levin generators on balcony.

Use The Levin Cell For Making Oxygen and Hydrogen and Save 66%

Buying Oxygen in cylinders is a waste of money. With the Levin Cell you can make your own oxygen at *one-third* what it costs you in cylinders; and get Hydrogen, which is a by-product of the operation, for nothing.

Levin Cells are easy to handle, and very compact, an installation taking up no more floor space than would be required to store and handle an equivalent number of cylinders.

From the standpoint of economy the arguments in favor of the Electrolabs System seem unanswerable—it is simply a case of paying one dollar or three for the same thing.

We have installed many plants, varying in capacity from 1000 cu.ft. of oxygen per day to over 35,000 cu.ft. of oxygen per day, that have taken advantage of these economies.

A large number of these installations have doubled and tripled their original capacity.

From many of our customers we have received second and third repeat orders.

Oxygen coming direct from the Levin Cells is 99.8% pure and better.

Write for full information.

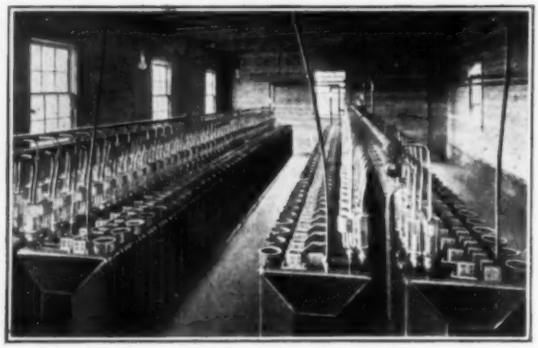
Electrolytic Oxy-Hydrogen Laboratories, Inc.

ISAAC H. LEVIN
Technical Director

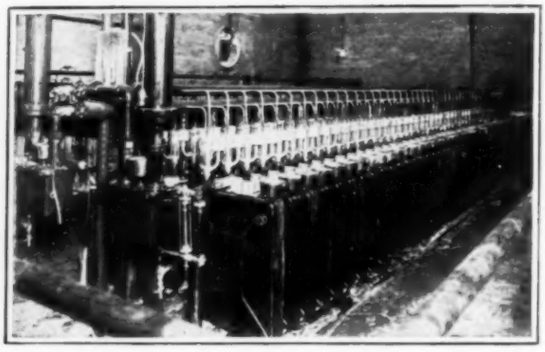
Laboratories and Works
Dayton, Ohio

Electrolabs
ELECTROLYTIC GAS SPECIALISTS

General Offices
15 William Street
New York



The Portland Oxygen & Hydrogen Co., Portland, Oregon,
operate 300 Levin generators.



Cleveland Wire Division of the General Electric Co., Cleveland, Ohio,
operate 100 Levin generators.

Three Prizes for the three Best Letters

What have YOU done with Low-Tin Babbitt and Solders?

THE WAR SERVICE ASS'N OF MANUFACTURERS OF SOLDER & BEARING METALS
CONSERVE TIN AND YOU SERVE YOUR COUNTRY

RULES OF CONTEST

Any consumer of Babbitt or Solder is eligible who has actually reduced the Tin content of his usual metal mixture or who has suggestions to offer in regard thereto.

Letters must not contain over 1000 words, but be sure to tell your story completely. Contest will close December first, 1918. Address all replies to "Tin Conservation Contest Manager, United Smelting and Aluminum Co., New Haven, Conn." Names of the winners will be announced in the trade papers December fifteen.

Judges will be Alfred Cochran, Secretary of the War Service Association of Babbitt and Solder Manufacturers; L. M. Brile, Sales Manager, United Smelting & Aluminum Co.; and L. J. Krcm, Managing Editor, The Metal Industry.

WE offer three prizes, $100, $50 and $25 for the three best letters telling of your experience with Babbitt and Solders containing a low percentage of Tin.

We have satisfied ourselves that low-tin Babbitt and Solders can be used without impairing service, quality or efficiency. We want your story to prove our case and, incidentally, we hope to get many new and valuable suggestions for the benefit of the trade in general. It is your duty to your country and yourself to join the patriotic movement of the War Service Association to do what you can to conserve tin.

Our Mechanical Department will be glad to assist you in arriving at the proper mixtures to use in Babbitt and Solders for your particular requirements. Simply explain the service fully, then let us ship you by express a trial order. When you have used the Babbitt or Solder we want to know experiences. However, you do not have to buy any of our products to be eligible to compete.

"Conserve Tin and Serve Your Country"

UNITED SMELTING & ALUMINUM CO.

NEW YORK, N. Y. 2316 WOOLWORTH BLDG.
NEW HAVEN, CT. 183-189 COMMERCE ST.
CHICAGO, ILL. 959 MONADNOCK BLOCK
DETROIT, MICH. 74-76-78 FORT ST. EAST

FOUNDRIES

—a field in which W·C·K have had long experience

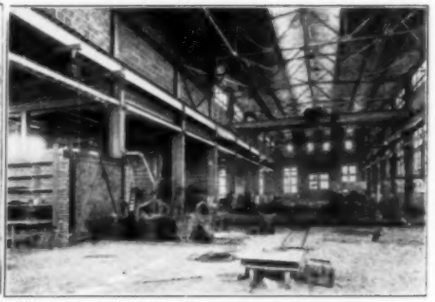
ENGINEERS and CONSTRUCTORS
A purely engineering organization with nothing to sell except services.
W·C·K

ENGINEERS and CONSTRUCTORS
A purely engineering organization with nothing to sell except services.
W·C·K

Westinghouse Electric & Mfg. Co., Essington, Pa. *Iron Foundry*

J. I. Case Threshing Machine Co., Racine, Wis. *Iron Foundry*

Cleveland Brass & Copper Mills, Inc., Cleveland, Ohio. *Brass Foundry*



Canadian Pacific Ry. Co., Ogden Shops, Calgary, Alberta. *Iron Foundry*

BECAUSE WCK have done a great deal of power plant and railroad work it does not follow that they are not equally well equipped to handle purely industrial projects. As a matter of fact we have built nearly 300 exclusively industrial plants.

The photographs show a few foundries designed and constructed by us, three of them for manufacturers.

During our 34 years' operation we have built several score foundries. Our experience in this direction should be of value to those contemplating the erection of structures of this type.

WESTINGHOUSE, CHURCH, KERR & CO., Inc.

Engineers and Constructors

37 WALL ST., NEW YORK

MONTREAL Shaughnessy Building
CHICAGO Conway Building
WASHINGTON Wilkins Building
SAN FRANCISCO Southern Pacific Building

Can We Help You

Help Your Country ?

You will conserve Tin

By Using

New Process Solder

which not alone costs less per pound but less per piece of perfect finished work.

New Process Solder

is used by the largest and more particular consumers of solder

New Process Solder

is manufactured solely by

MARKS LISSBERGER & SON, Inc.

Long Island City New York

N. B.—We will gladly give you the benefit of our many decades of experience on White Metal Alloys you are interested in.

STANDARD STAMPINGS

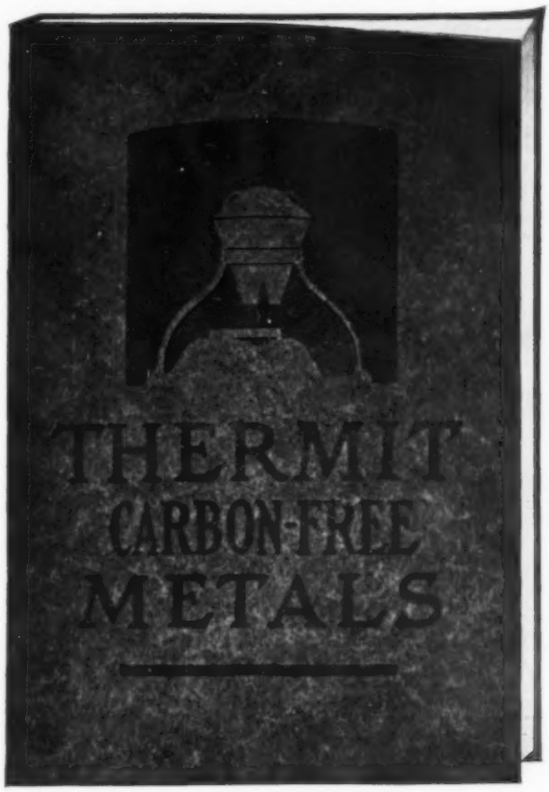
Submit your blue prints to us for an estimate on your next job. We specialize quick service and expert workmanship.

Metal Stampings
Deep Drawn Work
Manifolds
Difficult
Pipe Bends

STANDARD TOOL & MFG. CO.
70 LAFAYETTE BLVD. DETROIT, MICH.

Say you saw it in THE IRON TRADE REVIEW

Every Foundryman and Metallurgist Needs This Book



It covers fully the production and peculiar characteristics of Carbonfree Metals and Alloys. For the foundryman the chapter on *FERRO-TITANIUM* will be of special interest and value. It tells how to treat iron and steel with this alloy and of the beneficial results produced. Did you know, for instance, that two to three pounds of *Carbonfree* Ferro-Titanium are as efficient as fifteen pounds of a similar alloy containing carbon. Those troubled with porous castings or having a high percentage of defective castings profit greatly by the information contained in this chapter alone.

Tool steels and special alloy steels are covered in the chapter devoted to Carbonfree *PURE CHROMIUM* and *FERRO-CHROMIUM*. What do you know about these as produced free from carbon by the Thermit Process? Do you know, for instance, that they offer advantages possessed by no other Chromium Alloy for certain steel products?

Other metals and alloys treated are Ferro-Molybdenum, Tungsten, Ferro-Tungsten, Ferro-Vanadium, Manganese, Manganese-Copper, Manganese-Titanium, Ferro-Boron, Nickel-Copper and numerous other Thermit products.

Ask for Metals Book No. 2039

METAL & THERMIT CORPORATION

120 BROADWAY, NEW YORK

329-333 Folsom St., San Francisco
7300 So. Chicago Ave., Chicago
15 Emily St., Toronto, Ont.
1427-1429 Western Ave., Pittsburgh, Pa.
Factories located at Chrome, N. J.; Wyandotte, Mich.; East Chicago, Ind.; Jersey City, N. J.

Non-Copper,

Low Phosphorus

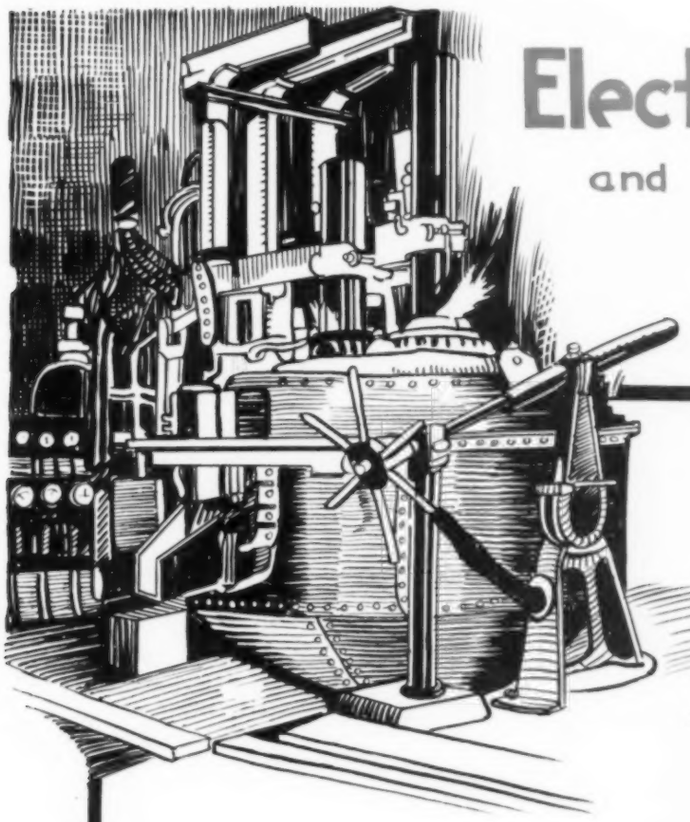
PIG IRON

All our Iron is allocated by the
War Industries Board,
Washington, D. C.

The Thomas Furnace Co.

Milwaukee,
Wisconsin

Say you saw it in THE IRON TRADE REVIEW



Electric Furnace and Converter Steel Castings

—castings any size up to 2 tons.

—daily capacity over 25 tons.

—200 employes.

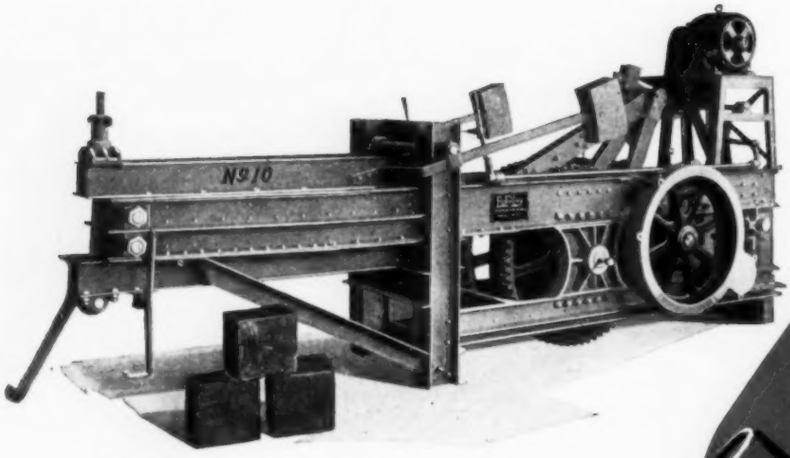
—a reputation for service and dependable castings.

Send us your blue-prints.

WEHR STEEL CO.

Milwaukee, Wisconsin

Say you saw it in THE IRON TRADE REVIEW



ALL STEEL ECONOMY FIRE PROOF

SCRAP METAL COMPRESSOR

This mechanically operated machine will increase the value of your scrap, stamping or punch skeletons, wire, trimmings, etc., from *50 to 100%*. It produces better bales of scrap-metal than the "Hydraulic" Compressed.

A 50 to 500% Investment

ALL STEEL ECONOMY FIRE PROOF

The "Economy" cuts labor costs of handling scrap, loading cars, etc., from 25 to 80%. It cuts storage space from 50 to 90%. It saves freight—permits full weight in cars. It enables you to save scrap that otherwise would be dumped or lost. It permits you to practice conservation in many ways that are of great benefit to both *you* and *Uncle Sam.*

The No. 10 Economy Scrap Metal Compressor illustrated, is not only lower in first cost, but it saves you installation expense, trouble, and the expensive upkeep of the slowly operating Hydraulic press.

Approximately 1000 Tons Pressure

is exerted on all four sides of the bale at once. The scrap is compressed practically into a solid block or billet.

If desired, it can be sunk, bringing compression box level with the floor.

This Baler is backed by 25 years of baler building experience. Ann Arbor builds more baling machinery than any other city in the world.

There's an Economy Baler for ever requirement. You cannot afford to miss our proposition—Get it. We have the largest and most complete line in the United States.

If you like, send us a sample of your scrap and we will bale and return it to you *gratis*—or we'll be glad to send you a machine on trial.

ECONOMY BALER CO.

ANN ARBOR, Dept. T. R. MICH., U. S. A.

Get Better Malleable Castings and Cores With The Proper Heat Control

High furnace heats produce warped, shapeless malleable castings. Low heats produce poor grade castings that will not pass even mediocre inspection.

Improperly dried cores have soft centres. When the hot metal is poured these moist core hearts form gas and blow the castings every time.

One batch of castings lost, means hundreds of dollars wasted. Whether you are a malleable man or a foundryman, the proper temperature control means hundreds of dollars saved in a year through better castings.

Put Brown Pyrometers in those malleable furnaces of yours, or Brown recording Thermometers in your core ovens. Ship more good castings, save time and get all the profit that's coming to you. A Brown equipment will save its cost many times over each year.

Write at once for full information to The Brown Instrument Company, Philadelphia, or any of their district offices in New York, Pittsburgh, Detroit, Chicago or St. Louis.

The Brown Pyrometer Equipment at Terre Haute Malleable & Mfg. Co., Terre Haute, Ind.

The Brown Recording Pyrometer

BROWN PYROMETERS

Pattern Making on a Machine Basis

THE

OLIVER

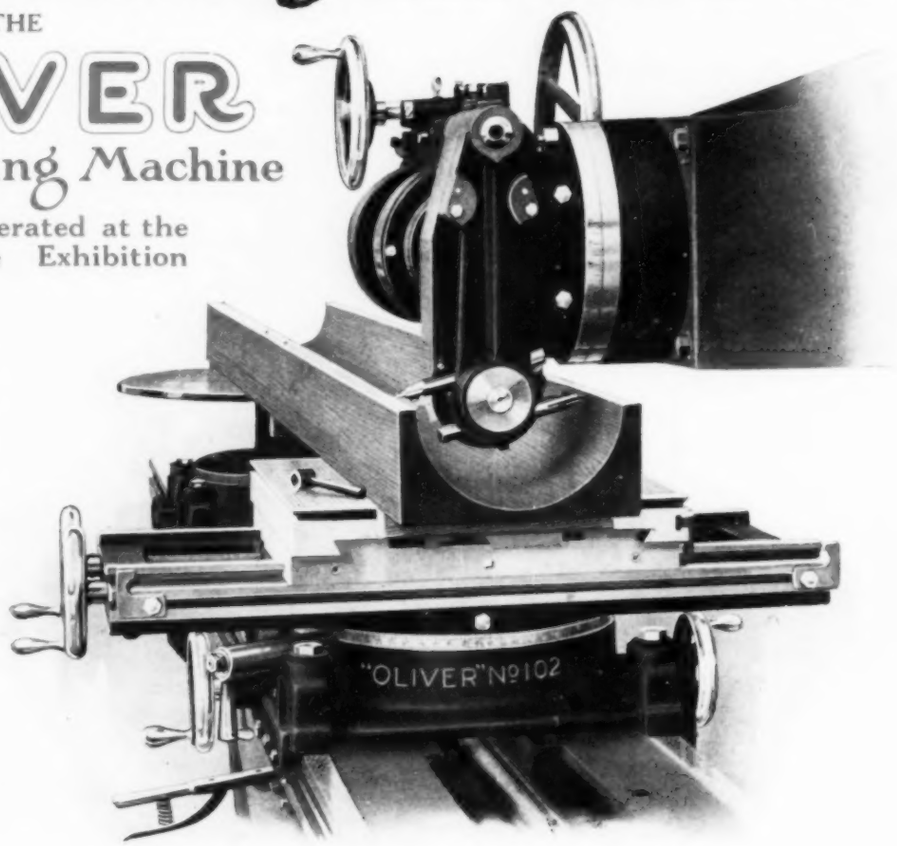
Wood Milling Machine

will be operated at the
Milwaukee Exhibition

Come to our exhibit and let us show you how to save labor and how to make your patterns quicker.

We will also show our

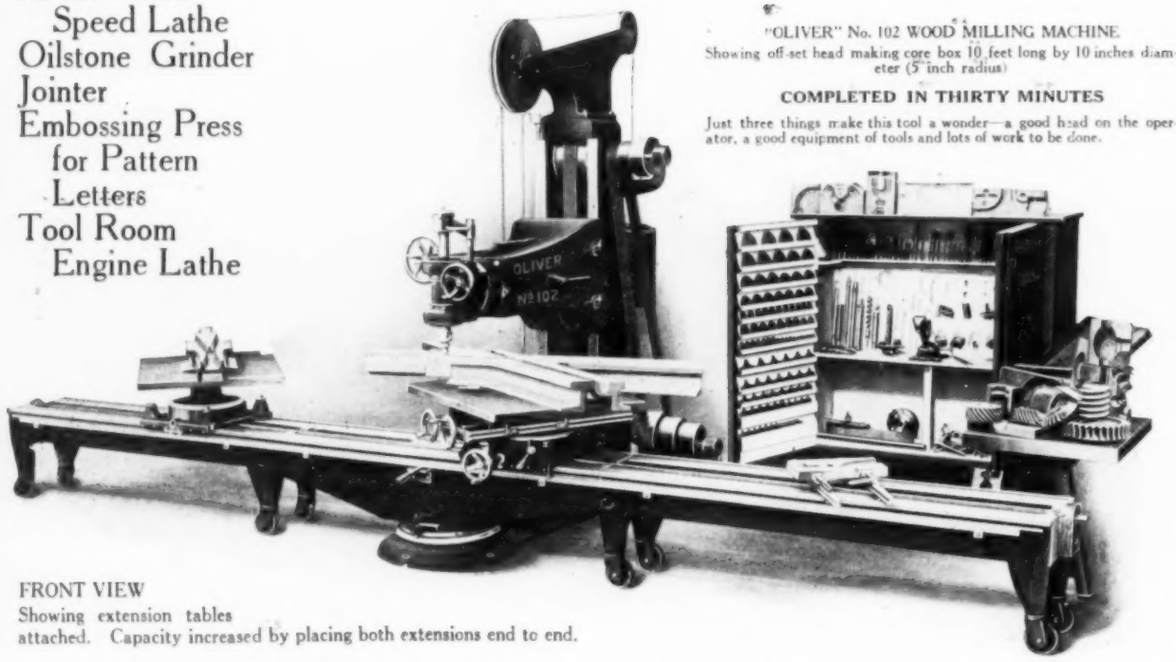
Small-Wood Milling Machine
Universal Saw Bench
Disc and Spindle Sander
Motor Head Speed Lathe
Oilstone Grinder
Jointer
Embossing Press for Pattern Letters
Tool Room Engine Lathe



"OLIVER" No. 102 WOOD MILLING MACHINE
Showing off-set head making core box 10 feet long by 10 inches diameter (5 inch radius)

COMPLETED IN THIRTY MINUTES

Just three things make this tool a wonder—a good head on the operator, a good equipment of tools and lots of work to be done.



FRONT VIEW
Showing extension tables attached. Capacity increased by placing both extensions end to end.

OLIVER MACHINERY COMPANY

GRAND RAPIDS, MICHIGAN, U. S. A.

Globe Tumbling Barrels

Double compartment 30 x 8 Burnishing Barrel

No. 16 Tilting Barrel

No. 3-S Sand Tumbling Barrel

You've been reading all kinds of exhortations to prepare for competition "after the war" by the adoption of more efficient methods.

Well, here's something you should have adopted long ago—war or no war.

The compartments of **GLOBE BURNISHING BARRELS** are of large diameter and narrow width. The design of the Barrel insures the attainment of the two factors necessary for successful Burnishing—pressure and friction.

GLOBE TILTING TUMBLING BARRELS permit the operator to reach in and take out a sample of the work without stopping the machine; they can be tilted to any angle causing a more violent or a more gentle tumbling; and when the work is finished, the Barrels are emptied by tilting with the handwheel.

The **GLOBE** line includes Tilting Barrels, Horizontal Water-tight Barrels for water and sand rolling and Burnishing Barrels.

There are more than twenty-five Barrels, one or more of which are adapted to your particular class of work.

Send for new SNE Book. It's chock full of interesting information about Tumbling and Burnishing.

The Globe Machine & Stamping Co.

1254 West 76th St. CLEVELAND

If You Needed a Furnace—

What Would Your First Consideration Be?

If you are like nine out of every ten other manufacturers you would say *"accuracy of heat control"*—because upon the accuracy of the heat-treating furnace depends the reputation of the product treated.

THE GILBERT & BARKER FURNACE

will accurately carry your heat treating through its critical stages. It insures a constant, uniform temperature, is absolutely accurate, and extremely economical in fuel consumption.

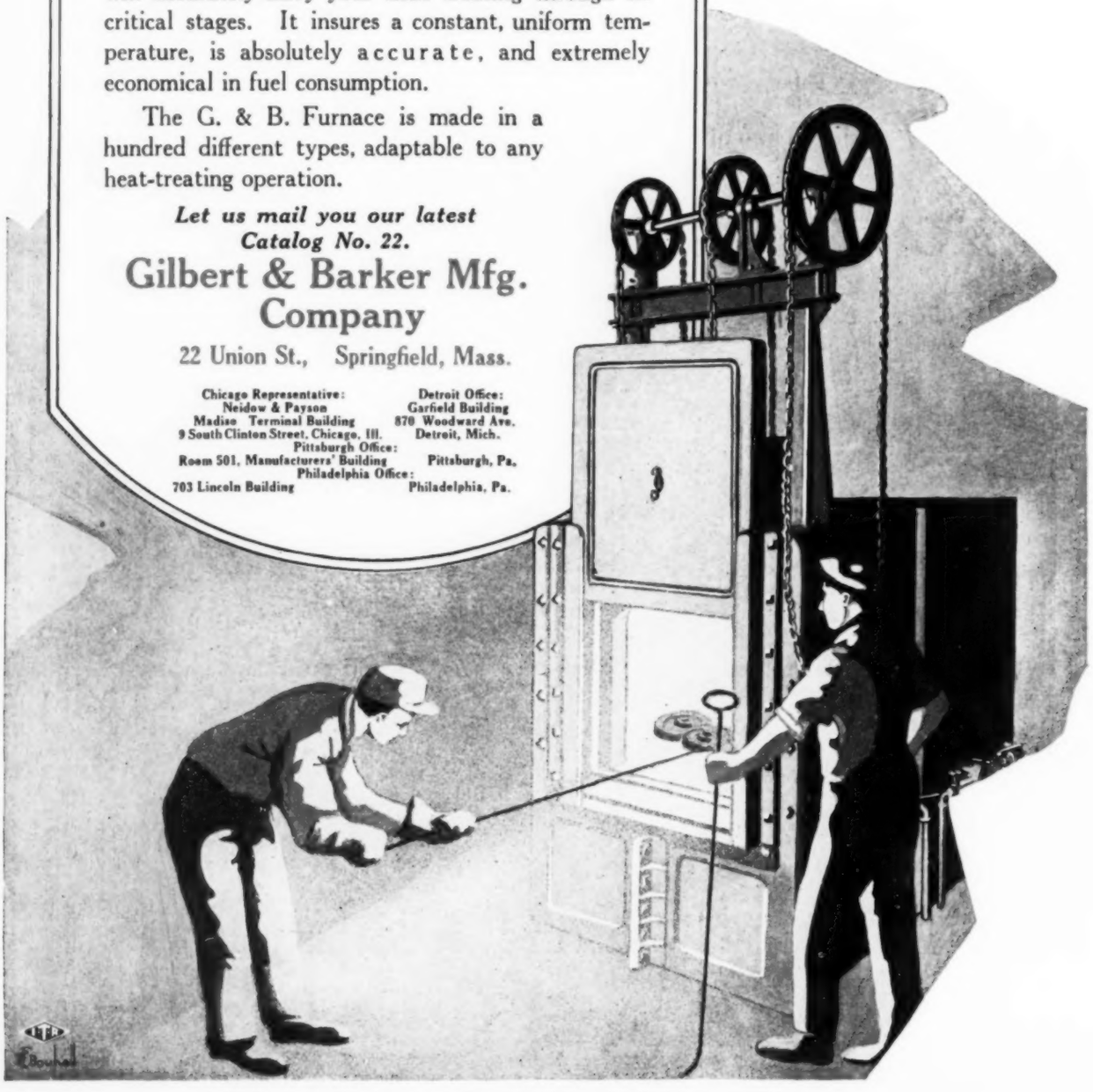
The G. & B. Furnace is made in a hundred different types, adaptable to any heat-treating operation.

Let us mail you our latest Catalog No. 22.

Gilbert & Barker Mfg. Company

22 Union St., Springfield, Mass.

Chicago Representative: Neidow & Payson, Madiso Terminal Building, 9 South Clinton Street, Chicago, Ill.
Detroit Office: Garfield Building, 870 Woodward Ave., Detroit, Mich.
Pittsburgh Office: Room 501, Manufacturers' Building, Pittsburgh, Pa.
Philadelphia Office: 703 Lincoln Building, Philadelphia, Pa.



Foundrymen in the East, West, North and South who have examined our furnaces in operation, declare the McLAIN-CARTER oil-fired, open hearth furnace to be the MOST FLEXIBLE STEEL MELTING UNIT IN AMERICA.

Castings formerly made of crucible steel are now being made ECONOMICALLY of open hearth steel.

A two ton heat for small castings melted in less than ***2 hours.***
A five ton heat in ***3 hours.***
Maximum capacity 7 ton per heat.
Deliveries 60 to 90 days.

A FIVE TON OPEN HEARTH FURNACE installed for the price of a ONE TON ELECTRIC.—Prepare for the future.

Maximum capacity of our ten ton furnace, twelve ton per heat.
Deliveries 90 to 120 days.

Write for full particulars free, or call at our booth No. 81, and arrange for a practical demonstration.

McLAIN-CARTER FURNACE CO.

806-Goldsmith Bldg.
Milwaukee, Wis.

Room 1858, No. 50 Church St.
New York City, N. Y.

A VISTA OF BRADLEY HAMMERS

The Bradley Hammers have been found practically indispensable in this big arms factory.

Accurate and rapid, these hammers attain big results in many kinds of forging. They are built to stand the strain of continuous work. With a Bradley you are sure of perfect control. Pressure on the foot treadle sets the hammer in motion. Release the treadle and a brake stops the hammer.

We have a series of bulletins clarifying our Bradley Hammers and Bradley Forges. We will be glad to send them in return for your postal.

C. C. Bradley & Son, Syracuse, N. Y.

FOREIGN AGENTS—England: Buck & Hickman, Whitechapel Road, London. Brazil, France, Belgium, Italy, Switzerland, Spain and Portugal: Fenwick Freres & Co., Paris, France.

Say you saw it in THE IRON TRADE REVIEW

GRATON & KNIGHT

Standardized Series

LEATHER BELTING

Tanned by us for belting use

18" Spar Oak Leather Belt on an extremely difficult Beater Drive, Berkshire Hills Paper Co., Adams, Mass.

BRUISING DRIVES

Constant trouble-maker drives become highly efficient when equipped with SparOak—that double service belt.

The pulley surface of SparOak Belting is Graton & Knight Spartan Leather—the highest frictional value ever attained in belting. The outside is finest quality of heavy Oak tanned center stock. The combination gives a belt that not only grips the pulley at high speed with fluctuating loads, but stands the mauling of hard service conditions.

If you have a troublesome, bruising drive, don't delay in learning about SparOak. For a whole class of belting dilemmas it is the answer.

Send for our new book — "Standardized Leather Belting"—which describes the character and application of SparOak and others of our Standardized Series.

The Graton & Knight Mfg. Co.

Oak Leather Tanners and Belt Makers

Worcester, Mass.
U. S. A.

Branches and Distributors in all Principal Cities

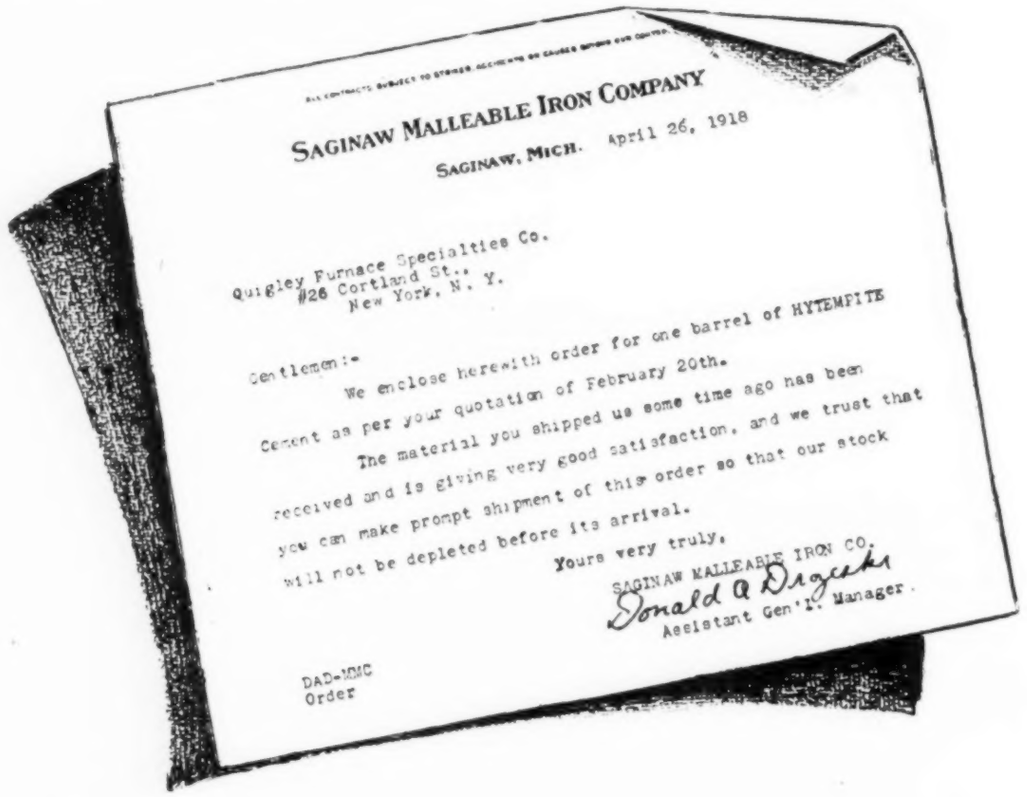
GRATON AND KNIGHT

IT GIVES SATISFACTION

Read what these people think of

HYTEMPITE

They can't be without it



SAGINAW MALLEABLE IRON COMPANY

SAGINAW, MICH. April 26, 1918

Quigley Furnace Specialties Co.
#26 Cortland St.,
New York, N. Y.

Gentlemen:-

We enclose herewith order for one barrel of HYTEMPITE Cement as per your quotation of February 20th.

The material you shipped us some time ago has been received and is giving very good satisfaction, and we trust that you can make prompt shipment of this order so that our stock will not be depleted before its arrival.

Yours very truly,
SAGINAW MALLEABLE IRON CO.
Donald A Dingeldein
Assistant Gen'l. Manager.

DAD-MMC
Order

HYTEMPITE makes permanent repairs on cracked crown arches, walls, etc., and when used as a bond for brick work the joints become as strong as the wall.

HYTEMPITE when used as a wash for thin coating for ladles adds life to them, facilitates removing the skull without injury to the lining.

HYTEMPITE when mixed with old crushed fire brick or carborundum fire sand will make rammed-in linings.

HYTEMPITE will repair pit or tilting crucible or open flame melting furnaces, and many other purposes.

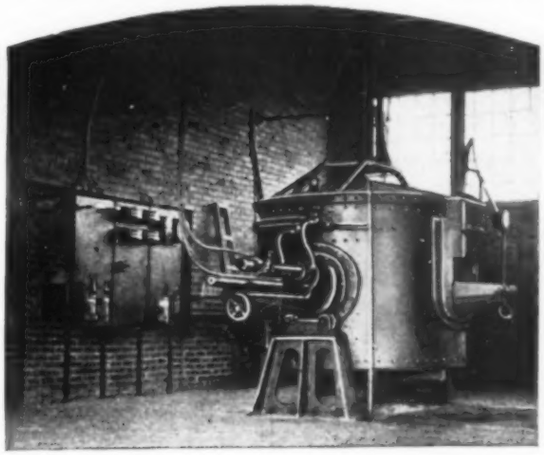
QUIGLEY FURNACE SPECIALTIES CO., Inc.

26 Cortlandt Street, New York

IMMEDIATE DELIVERY FROM STOCK AT

Baltimore	Detroit	New York	St. Louis	Toronto
Birmingham	Denver	Niagara Falls	Salt Lake City	Vancouver
Chicago	El Paso	Oakland	Scranton	Winnipeg
Cincinnati	Indianapolis	Portland (Ore.)	Seattle	Tokio, Japan
Cleveland	Los Angeles	Richmond	Montreal	

Can be preheated by electricity



Basic or Acid Operation High Power Factor

The Rennerfelt Electric Arc Furnace

One hundred and thirty are now being used or are under construction for melting steel, cast iron, ferro manganese, nickel copper, bronze, etc. The U. S. Mint, after six months' operation of a 1000-lb. Rennerfelt for melting bronze and nickel for coins, placed additional orders for one more furnace of 1000 lb. capacity and one of one ton capacity.

Results at U. S. Mint, Philadelphia, Pa.

Cupro-Nickel		BRONZE	
No. of lb. to heat	1000	No. of lb. to heat	1000
KWH used per ton	500	KWH used per ton	300
Time per heat	90 min.	Time per heat	65 min.
Approximate loss	.0032	Approximate loss	.0032

Melting Silver Dollars

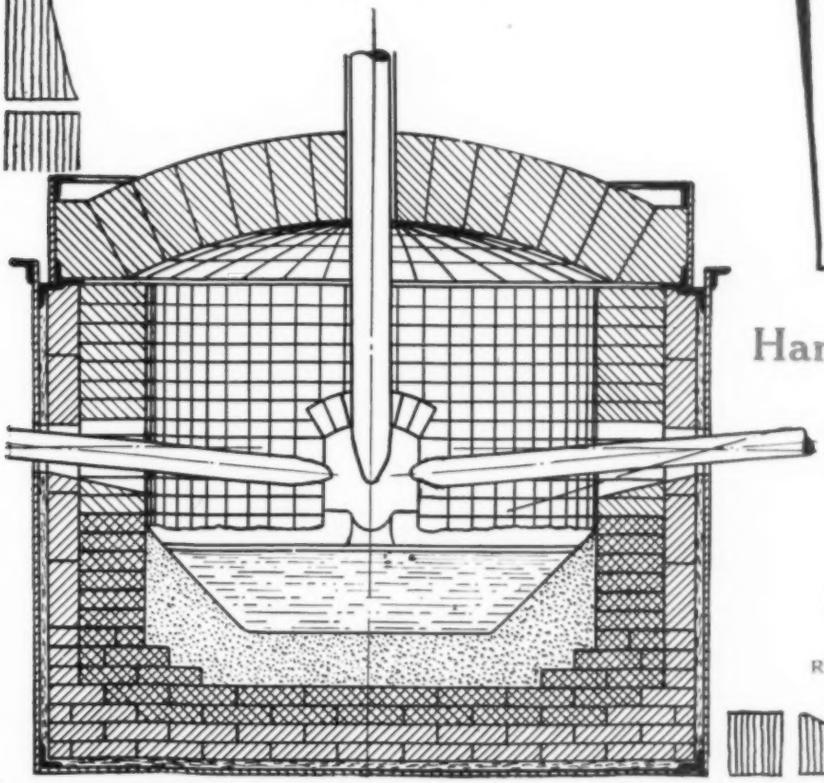
No. of lb. to heat	1000
KWH used per ton	200
Time per heat	50 min.
Approximate loss	.0005

Newton, Iowa, June 3, 1918

Hamilton & Hansell,
13-21 Park Row, New York.

At the present time we are taking out eight, nine and ten heats a day from our furnace, the heats ranging in size from 2000 to 2500 pounds, melting from 15,000 to 20,000 pounds of metal per day. The furnace is certainly operating fine and the quality of the steel we are making is superior to anything that has ever been received from outside plants.

THE PARSONS COMPANY.



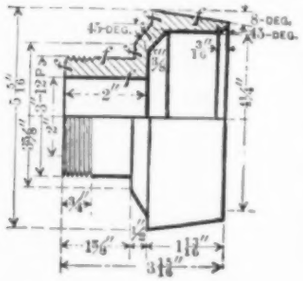
Hamilton & Hansell Inc.

13-21 Park Row
New York City
Rialto Bldg., San Francisco

Warner & Swasey Screw Machines and Turret Lathes

This Clutch cone—too difficult for the ordinary screw machine—is completed in ten minutes on a Warner & Swasey No. 4 Universal Screw Machine. It is made in 6 operations with but one chucking.

Thru the simultaneous operation of turret and carriage the work is quickly done without sacrifice of accuracy.

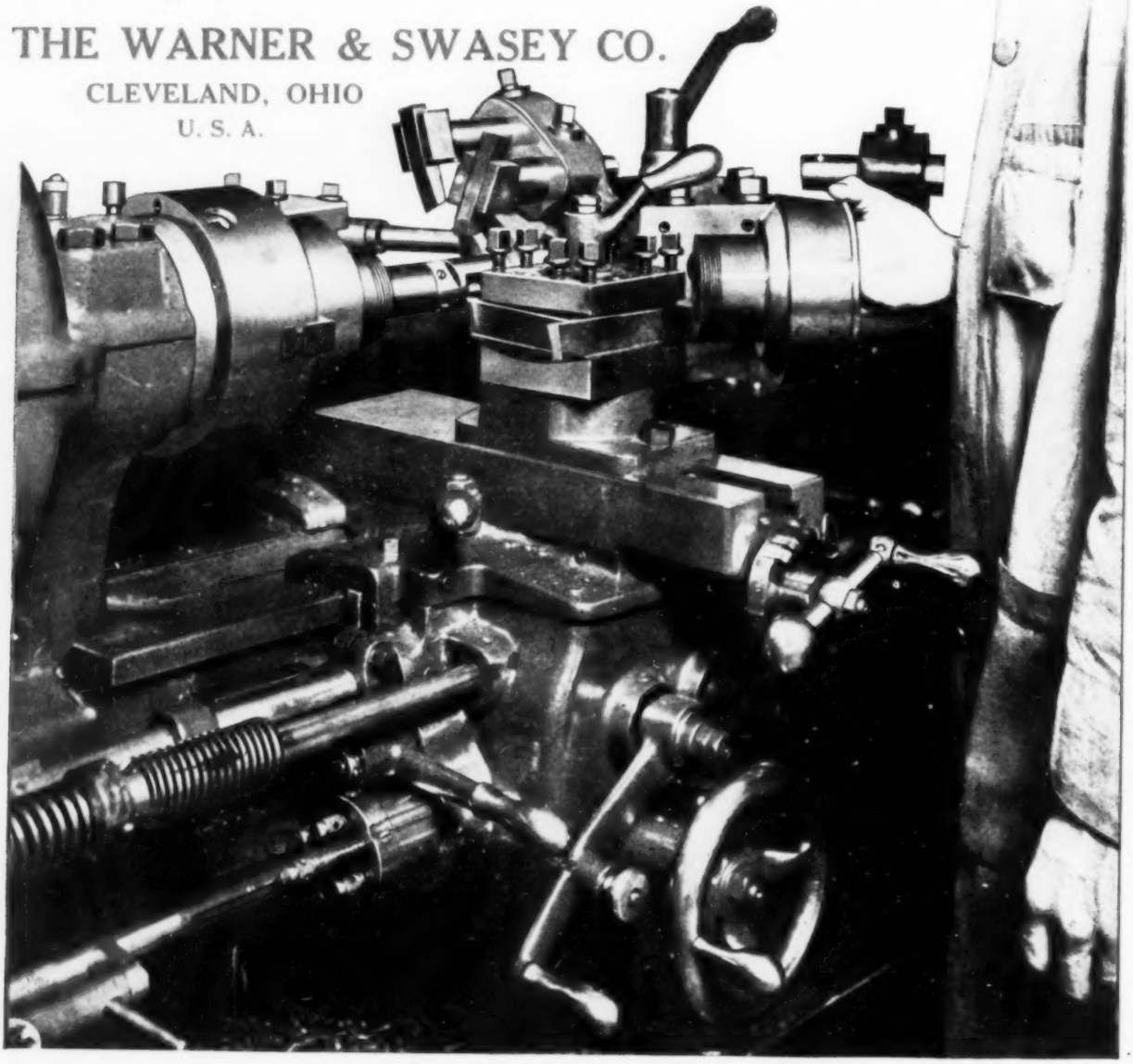


This job will be demonstrated at the Exhibit of the American Foundrymen's Association. A No. 2-A Universal Hollow-Hexagon Turret Lathe will be there also to show you a few things it can do.

The Warner & Swasey Exhibit will be in spaces 325 and 326 Milwaukee Auditorium, Milwaukee, Wisconsin, Oct. 7th to 12th.

THE WARNER & SWASEY CO.

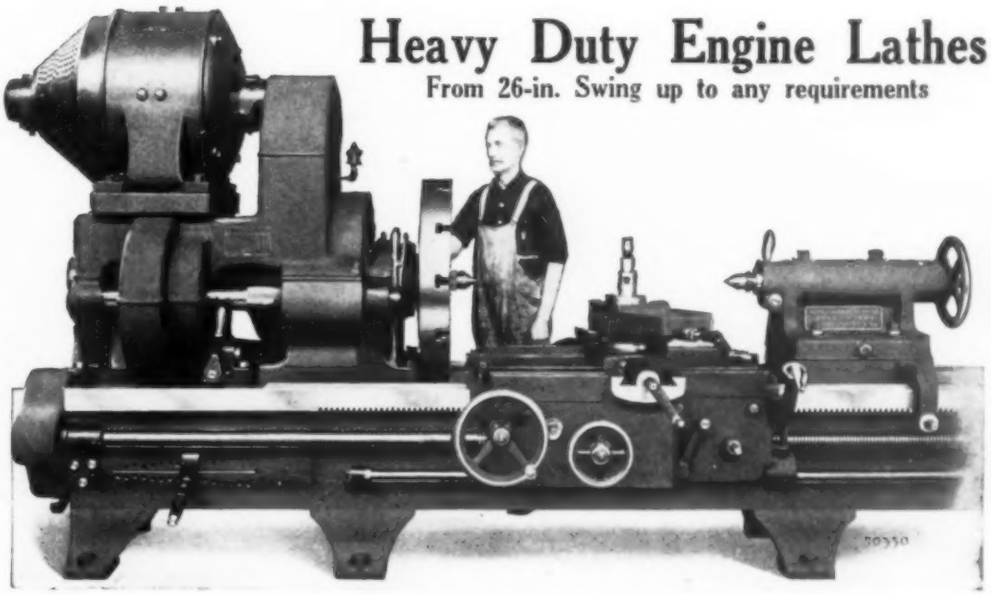
CLEVELAND, OHIO
U. S. A.



MACHINE TOOLS

Complete Machine Tool Equipments
for
General Machine Shops, Railroad Shops Shipyards and Arsenals

Heavy Duty Engine Lathes
From 26-in. Swing up to any requirements



30-inch Double Geared Engine Lathe.

Write for 4-page Circular

Electric Travelling Cranes - Steam Hammers

NILES-BEMENT-POND CO.

GENERAL OFFICES. 111 BROADWAY, NEW YORK

OFFICES AND AGENCIES—Boston: 93-95 Oliver St. **Philadelphia:** 405 N. 21st St. **Pittsburgh:** Frick Bldg. **Cleveland, O.:** The Niles Tool Works Co., 730 Superior Ave. **Hamilton, O.:** The Niles Tool Works Co. **Cincinnati:** The Niles Tool Works Co., 338 W. Fourth St. **Detroit:** Kerr Bldg. **Chicago:** 571 W. Washington Blvd. **St. Louis:** 516 N. Third St. **Birmingham, Ala.:** 2015 First Ave. **San Francisco:** 16 to 18 Fremont St. **London, Eng.:** 25 Victoria St. S. W. **For Colorado, Utah, Wyoming and New Mexico:** Hendrie & Bolthoff Manufacturing & Supply Co., Denver. **For Canada:** The John Bertram & Sons Co., Ltd., Dundas, Montreal, Toronto, Winnipeg, Vancouver.

WUEST HERRINGBONE GEARS

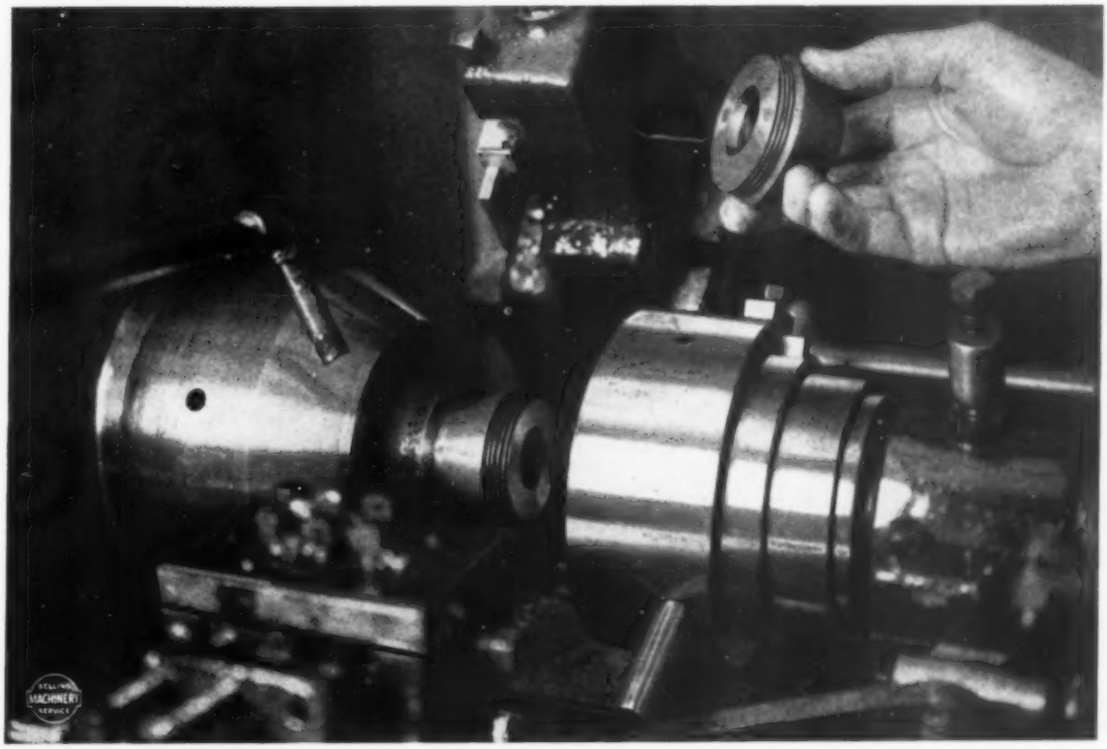
If you are interested in obtaining
—maximum mechanical efficiency
—elimination of shock and vibration
—minimum noise
—absolute reliability
specify ***Wuest Herringbone Gears,*** manufactured by the Falk Company from Falk Steel Castings.

Wuest Herringbone Gears are hobbed from solid blanks.

We own and operate one of the largest Steel Foundries in the West, capacity 1 lb. to 100,000.

The Falk Company
Milwaukee, Wis.

Say you saw it in THE IRON TRADE REVIEW



The Solution of Threading Problems

is found in the **Modern Self Opening Die Heads.** The photograph shows one of these die heads threading steel adapters for high explosive shells. For internal threading on shell work, **Modern Collapsing Taps** are used with great success. A **"Modern"** catalog will show you where this equipment can save money and solve threading problems—send for it.

Modern Tool Company

Main Office and Works :

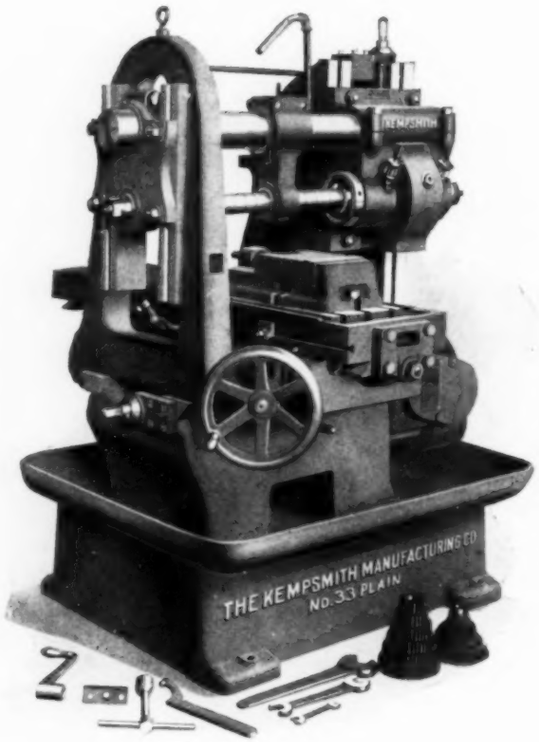
3rd and French Sts., Erie, Pa.

Branch Offices :

New York: 2 Rector St. Detroit: 1223 Dime Bank Bldg.
Chicago: 32 N. Clinton St. Cincinnati: 2 Greenwood Office Exchange

MODERN

KEMPSMITH



OUR EXHIBIT—

WILL include one of these manufacturing milling machines with individual motor drive. Our West Allis shops will welcome visitors and special arrangements have been made to make your visit interesting and profitable.

The Kempsmith Manufacturing Co.

Milwaukee, Wis., U. S. A.

IMMEDIATE DELIVERIES

WHEN you need High Speed and Carbon Tools you need them ***quick***—because nothing else will do.

We make a specialty of furnishing these necessities ***quick***.

We are waiting to serve you

Drills Reamers
Milling Cutters
End Mills Countersinks

Also

Micrometers, Drills, Chucks and **Special Tools** of all kinds

WRITE US

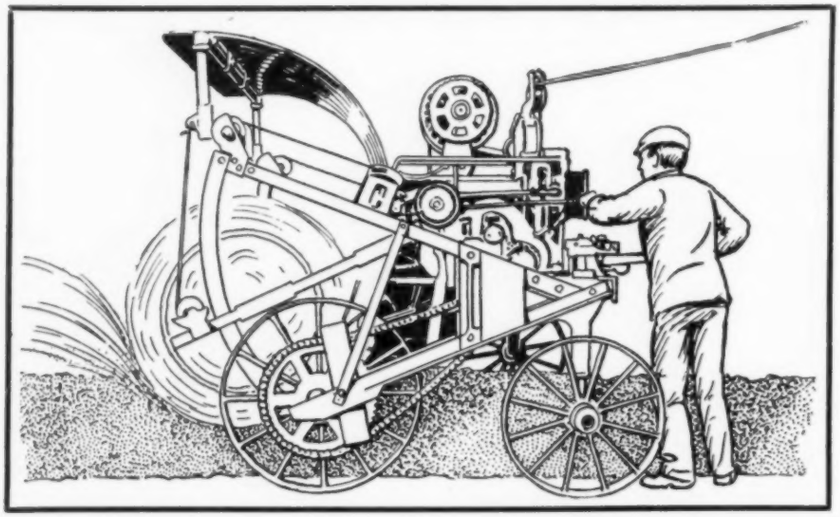
M. JAEGER

MACHINERY, TOOLS AND SUPPLIES
342-344-Engineers Bldg.
CLEVELAND, OHIO

Say you saw it in THE IRON TRADE REVIEW

TWO GREAT OPPORTUNITIES:

To Save Labor
To Boost Production



The Auto Sand Cutter

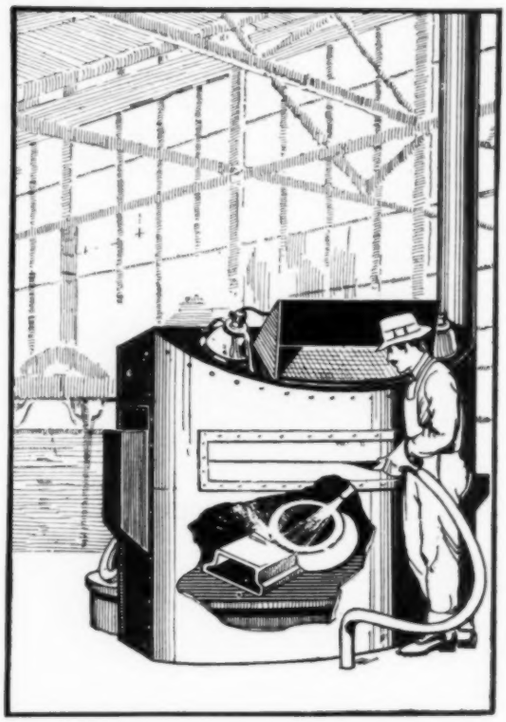
Cuts and mixes foundry sand at lower cost, with less labor.

Perfect sand condition gives more castings and less scrap.

"Humane" Rotary Table Sand Blast Room

Makes sand blasting as healthful and agreeable as any job in the foundry.

Contented workmen produce more and better work.



Exhibited in Machinery Hall
Spaces 213-220

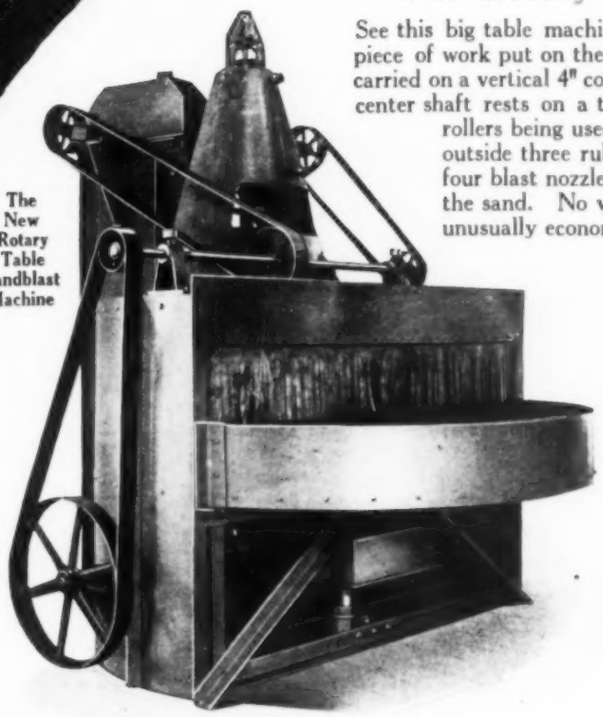
AMERICAN FOUNDRY EQUIPMENT CO.
THE SAND MIXING MACHINE CO., Inc.

52 Vanderbilt Ave., New York City **Factory: Cleveland, Ohio**

See These at

The Milwaukee Convention

The Rotary Table Sandblast Machine



The New Rotary Table Sandblast Machine

See this big table machine that thoroughly blasts every surface of every piece of work put on the table. The revolving table is 84" in diameter, carried on a vertical 4" cold rolled shaft, driven by a gear and worm. The center shaft rests on a thrust bearing and supports the entire table, no rollers being used. One-third of the surplus of the table extends outside three rubber curtains. The rotating sand hopper carries four blast nozzles set at an angle, the centrifugal motion feeding the sand. No valves are used. Simple, sturdy, automatic and unusually economical.

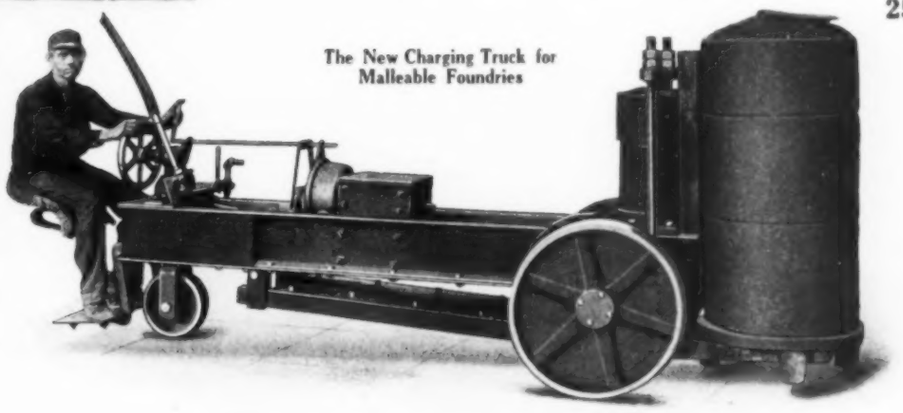
A New Charging Truck for Malleable Foundries

A new charging truck that will cut operating costs in two—that will save labor—that will give maximum service with the least maintenance expense. The main frame is made of two channel beams. The forged steel raising and lowering arms are equipped with renewable cast steel tangs. The air cylinder for raising annealing pots is controlled by a valve near the operator's seat. A reversible air motor drives through a set of reduction gears and a standard auto truck differential to pinions engaging the internal gears on the under side of the wheel flanges. Steering is by means of a standard auto truck steering worm. Low air consumption—low maintenance costs.

BROWN SPECIALTY MACHINERY CO.

Makers of the Hammer Core Machine and Duplex Shaker

2536 W. 48th Place
CHICAGO



The New Charging Truck for Malleable Foundries

Write for Complete Details of This New Equipment

Let us shoe your "Steel Mules"

RACINE STEEL CASTINGS

will add both ***strength*** and ***endurance*** to your ***tractors*** or ***trucks.***

Our foundry is located in the center of the Great Milwaukee District—close to mines, railroads and water—at the gates of the great western farms—at the door of the East's busy factories.

Benefit from our unusual facilities—place your order for castings now.

RACINE STEEL CASTINGS COMPANY
RACINE **WISCONSIN**

Say you saw it in THE IRON TRADE REVIEW

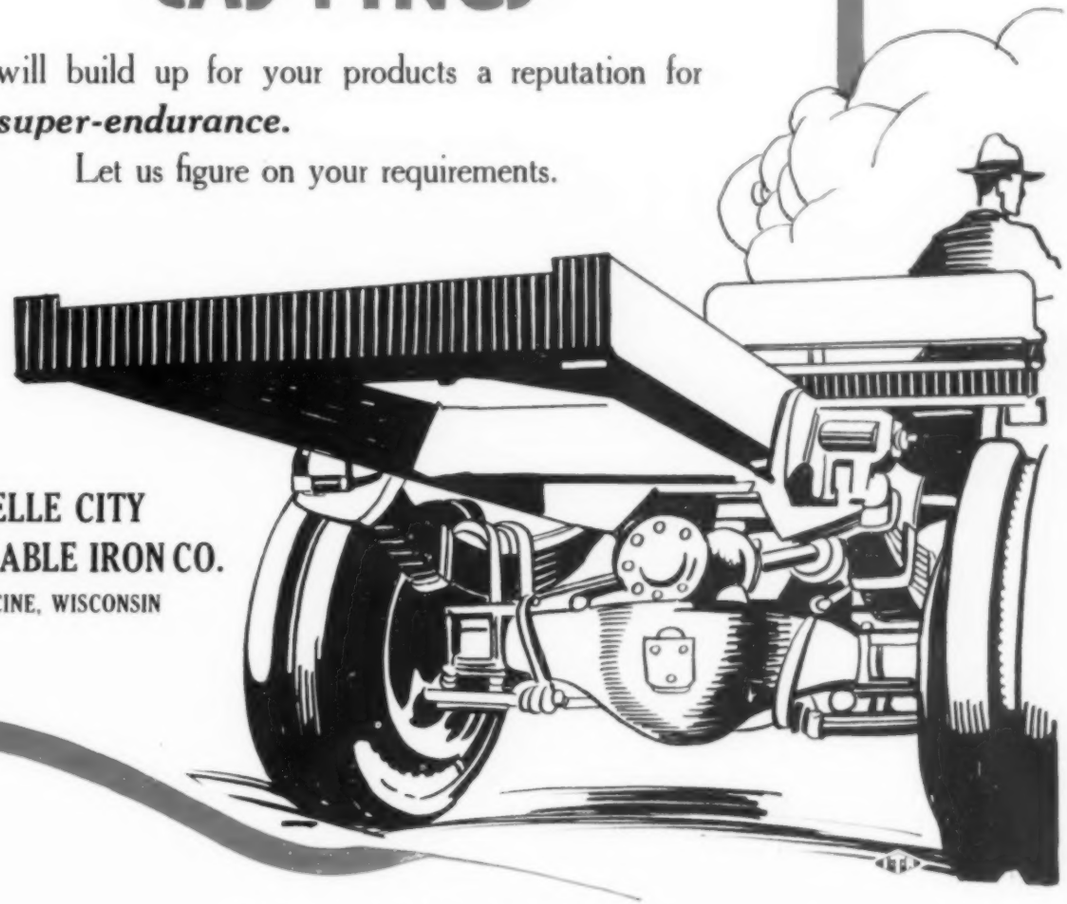
Make your trucks "Trucks of Endurance"

The reputation of a ***truck*** or ***tractor*** is judged by its ability to withstand the shock of rough roads and fields.

RACINE — REFINED ELECTRIC STEEL MOTOR TRUCK and TRACTOR CASTINGS

will build up for your products a reputation for ***super-endurance.***

Let us figure on your requirements.



BELLE CITY MALLEABLE IRON CO.
RACINE, WISCONSIN

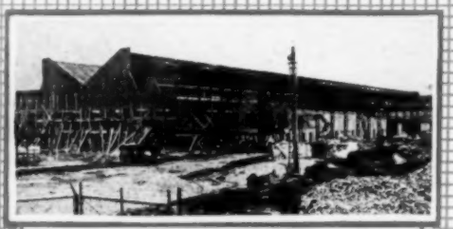
Say you saw it in THE IRON TRADE REVIEW

Complete Industrial Engineering Service

MAY 13, 1918

JUNE 11, 1918

JUNE 24, 1918



JULY 8, 1918

JULY 22, 1918

Progress

is the one word which best typifies the activities of American foundrymen during the past few years.

No little part of this progress has been in the line of better buildings, with adequate light and ventilation and proper layout for economical production.

In this direction our organization has contributed a substantial share of thought and effort.

A recent example of our work is the Electric Steel Company's quarter million dollar addition in Chicago, shown in the illustrations on the left. This was designed and built complete as shown, in ten weeks from date of contract.

When you think of building, and want the one best foundry for your particular purpose, write for our booklet, "The Modern Foundry."

FRANK D. CHASE,
INCORPORATED
INDUSTRIAL ENGINEERS

CHICAGO: PEOPLES GAS BUILDING. WHITEHALL BUILDING: NEW YORK